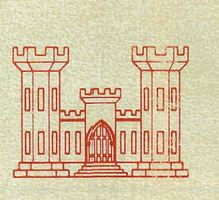
FORT BENNING, GEORGIA

TERRAIN ANALYSIS



PREPARED BY

THE TERRAIN ANALYSIS CENTER

US ARMY ENGINEER TOPOGRAPHIC LABORATORIES

FORT BELVOIR, VIRGINIA

SEPTEMBER 1976

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
SEP 1976		**00-09-1976 to 00-09-1976**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Terrain Analysis. Fort Benning, Georgia	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **The Terrain Analysis Center,U.S. Army Engineer Topographic Laboratories,Fort Belvoir,VA,22060**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**		**38**	

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

TABLE OF CONTENTS

PREPARED BY

THE TERRAIN ANALYSIS CENTER

US ARMY ENGINEER TOPOGRAPHIC LABORATORIES

FORT BELVOIR, VIRGINIA

SEPTEMBER 1976

I. INTRODUCTION

BACKGROUND

This study was prepared by the Terrain Analysis Center (TAC) of the US Army Engineer Topographic Laboratories (ETL) in response to a letter request dated 23 January 1976 from Major General W. R. Wray, Assistant Chief of Engineers (ACE). The request was for a terrain analysis of Fort Benning to be conducted in two phases: a first-phase maneuverability study, which was completed in June 1976, and this second-phase, full terrain analysis. Scope, content, and format of the study were reviewed and concurred in by the ACE staff.

PURPOSE

The ACE request for this terrain analysis of Fort Benning emphasized the essential nature of the study in supporting his presentations before Congressional Committees in appraising the relative merits of US Army installations for stationing purposes. Such analyses are also useful to the ACE in support of staff studies directed by the Congress including division/brigade base alignments and division conversion studies. Staff planners concerned with these matters must obtain an appreciation of the on-post terrain that includes, among many other things, knowledge of the suitability for conducting field training exercises involving maneuverability of troops and military vehicles. The degree of maneuverability that can be achieved is a function of several terrain factors including slope, surface configuration, soils, vegetative cover, and surface drainage, all of which are treated in the study.

Planners concerned with troop stationing also need certain off-post information such as statistics on housing, schools, hospitals, and public utilities in urban areas near installations, as well as pertinent data on airfields and ports in the vicinity. These things are also treated in the study.

Since this study was prepared to serve troop stationing and similar requirements, the support provided to environmental requirements is only incidental. While some of the information contained in the study may be useful as environmental baseline data, the study is by no means a complete environmental inventory of the kind required in support of environmental impact assessments.

SCOPE

In scope, the terrain analysis is a compendium of available data on the pertinent natural and man-made features of the reservation and an evaluation of their effects on tactical military operations. The study effort did not include basic research to fill gaps in these data although some short-term field investigations were performed to obtain ground truth and a general overall appreciation of terrain elements. Therefore, the scope of the analysis is limited primarily to those factors which have been documented by other authorities and to the results of analysis and evaluation of those factors by senior terrain analysts for topics such as cross-country movement, cover and concealment, and water resources.

The terrain analysis preparation process has necessarily involved analytical judgment in the selection of pertinent source data, resolution of data conflicts, recognition of interrelationships not previously made explicit, and the application of remote sensing to update certain critical, time-variant data such as vegetative cover and man-made features including roads, airfields, and facilities constructed outside of the cantonment areas.

LIMITATIONS

The study naturally reflects limitations in the quality, amount, and currency of the source data on which it is based. Numerous field interviews and selective use of remote sensing were employed in an effort to assure presentation of the latest and best information. Within the relatively complex topical scope of the analysis, however, there are a number of aspects on which source data have not been generated with the focus or recency desired to meet objectives fully. As noted under Scope, the study effort was not designed to include basic research as a means of filling gaps in data.

By design, the presentation is cast at a level of data coverage consistent with stated objectives. Users interested in deeper pursuit of data are referred to the List of Sources in the back of the study.

PRESENTATION

Maximum use of graphic presentation has been made throughout the terrain analysis. Supporting text is, as far as practicable, in tabular format keyed to the related graphics which follow. The primary map scale is 1:50,000. For Urban Areas (Cantonment Areas), five larger scale maps are used and for Off-Post Features, the map scale is 1:1,000,000.

STUDY AREA

The Fort Benning military reservation is located on the northern edge of the Atlantic Coastal Plain adjacent to Columbus, Georgia, in the west-central part of the state. Part of the reservation lies across the Chattahoochee River which forms the Georgia-Alabama border. Of the 181,835 acres comprising the reservation, 12,156 acres are in Alabama. Stretching about 20 miles north-south and east-west, Fort Benning covers parts of three counties—Muscogee and Chattahoochee in Georgia and Russell in Alabama.

The predominantly rolling, pine-covered surfaces are highest in the east, up to 740 ft above sea level, and lowest in the southwest, about 190 ft along the Chattahoochee River. The flattest surfaces are along the Chattahoochee River and its mainly southwestward flowing tributaries; nearly all of the reservation is drained by this stream network. Most of the larger broadleaf deciduous stands line these streams, although there are some fairly large areas of scrub oak, particularly in the northeast. Numerous small to large grassy fields are interspersed throughout the forested areas, particularly in the southwest and northwest. Vegetative growth is stimulated by a humid climate, characterized by long, hot summers and short, mild winters.

II. DESCRIPTION AND MILITARY ASPECTS OF TERRAIN

A. SURFACE CONFIGURATION

Fort Benning is situated on flat to rolling and hillocky surfaces along the northern edge of the Atlantic Coastal Plain. Gently rolling to rolling surfaces predominate, separated by flat to gently rolling areas along the Chattahoochee River and tributaries.

LANDFORM TYPE	LANDFORM DESCRIPTION AND DISTRIBUTION	ELEVATION
1. Low Plains	Broad, flat to gently rolling plains dominate the southwestern and south-central parts of reservation, extending about 25 km (15 miles) northeast-southwest. Other areas of flat to gently rolling surfaces in floodplains of Upatoi Creek and major tributaries. Gently rolling to rolling plains elsewhere but commonly along northern edge of reservation and on plateau-like surface with scattered sand dunes in northeast. Local relief is largely between 25 and 45 m (82 and 148 ft); lowest, 6 m (20 ft) on Chattahoochee floodplain in southwest corner of reservation; highest relief, up to 50 m (164 ft) in northern and northeastern parts of reservation. Slopes largely between 0 and 3 percent on flat to gently rolling floodplains and 3 to 15 percent on gently rolling to rolling surfaces; slopes 30 to 45 percent and in places greater than 45 percent, most common along deeply incised valleys (9 to 15 m deep) along margins of floodplains; equally steep along narrow valleys of some smaller streams.	Elevations largely between 75 and 105 m (246 and 344 ft) above sea level; lowest elevation, 58 m (190 ft) along Chattahoochee River in southwest corner of reservation; highest elevation, 192 m (630 ft) on plateau-like surface in northeast.
2. High Plains	Irregularly shaped, moderately rolling to hillocky plains varying greatly in size in all parts of reservation but southwest. Commonly separated by low plains of major stream channels. Crests of rolling and hillocky plains in southeast more dissected, narrower, and less continuous than in north. Steep-walled ravines common throughout; some narrow gullies with near-vertical banks. Local relief largely between 55 and 65 m (180 and 213 ft); highest relief 91 m (300 ft) on southeastern border. Slopes largely between 8 and 15 percent; lower valley slopes commonly between 15 and 30 percent and some 30 percent to over 45 percent. Slopes along south bank of Upatoi Creek and in many places in southeast commonly 30 to 45 percent and higher. Small areas with slopes 0 to 8 percent scattered throughout.	Elevations largely between 90 and 150 m (295 and 492 ft) above sea level. Lowest elevation, 61 m (200 ft) on northern edge of main cantonment area. Highest elevation, 225 m (740 ft) in the southeast corner of reservation.

B. SURFACE DRAINAGE

All of the surface water of Fort Benning eventually empties into the Gulf of Mexico. Most of the streams drain into the Chattahoochee River, which flows southeast through the western part of the reservation, while a very small area in the southeast corner of Fort Benning drains into the Flint River Basin to the east; the two rivers join to the south and continue to the Gulf. The northern portion of Lake Walter F. George, a large impoundment on the Chattahoochee River with total area of 45,000 acres and a usable storage capacity of 210,000 acre-feet, extends through the reservation.

There is one streamflow gaging station within the reservation at McBrides Bridge on Upatoi Creek. Another nearby station is on the Chattahoochee River, 15 km (9.3 miles) upstream of the reservation boundary at the Central of Georgia Railway bridge in Columbus. Discharge records from these stations indicate the high-water period to be from January through April with lowest water generally in September and October. A crest-stage partial-record station is located on Juniper Creek (a tributary of Upatoi Creek) at State Route 41 about 4 miles east of the reservation; the annual maximum discharge at this station for the 1975 water year on 15 April was 1510 ft³/sec.

Several dams have been built on the Chattahoochee River upstream of Fort Benning to regulate river flow. During periods of flooding, these dams would lengthen but lower the crest stages, and only extreme floods would cause severe overflow adjacent to the river. The U. S. Geological Survey has mapped (1970-1973) flood-prone areas in the Fort Benning area, delineating areas that have a 1-in-100 chance on the average of being inundated during any year. These maps indicate that a 100-year flood would probably inundate a large area on the west side of the Chattahoochee River near the mouth of Uchee Creek and most of the area in the vicinity of Lae Field and southward; backwater from the Chattahoochee River would extend a considerable distance up Upatoi Creek. Local flooding could be expected in the valleys of most streams, particularly Upatoi, Uchee, Pine Knot, Ochillee, Randall, and Oswichee Creeks. The 1929 flood, equivalent to a 130-year flood, inundated the Lawson Army Airfield area, and Chattahoochee River backwater extended up Upatoi Creek as far as McBrides Bridge.

Beavers are very active on the reservation and have built dams on many of the smaller perennial streams. In some cases the backed-up waters have contributed substantially to the creation of locally wet conditions along several streams. Several fairly large areas in the northeast part of the reservation have been made practically inaccessible by beaver dam building activity.

DRAINAGE CHARACTERISTICS

DRAINAGE CATEGORIES	GENERAL	REGIME	WIDTH	BANKS	BOTTOMS	DEPTH	VELOCITY AND DISCHARGE
Watercourses							
Chattahoochee River	Incised major perennial stream meanders broadly over extensive lowlands in a southerly direction. Navigable section to Columbus is part of pool of Walter F. George Reservoir.	High water, January through April. Receding flows to September and October, the lowest water period.	Over 122 m (400 ft) during high water. Dredged navigation channel is 30.5 m (100 ft) wide.	Mostly sandy silt and sandy clay with some sand. Generally 2-6 m (6.6-19.7 ft) high and steep, reaching 70% slope in many stretches. Terraces immediately behind banks may reach over 15.2 m (50 ft) above water level and are somewhat less steep.	Mostly sandy and silty with gentle gradient.	Navigable channel dredged to 2.7 m (9 ft); most times about 2.1 m (7 ft) due to siltation.	Velocity controlled by upstream and downstream dams. At Columbus gage, maximum discharge for period of record is 4110 m³/sec (145,000 ft³/sec) on 26 Feb 1961. Minimum discharge is 8.33 m³/sec (294 ft³/sec) on 23 Oct 1931. Average discharge is 190 m³/sec (6715 ft³/sec). (See table below for mean monthly discharges.)
Upatoi Creek	Perennial stream meanders through broad valley in a southeasterly direction to Chattahoochee River. Bordered in places by swamps.	High water, January through April. Low water, June through November.	Generally about 15.2 m (50 ft) in the east to about 45.7 m (150 ft) toward mouth.	Mostly clayey sand with some sand. From about 1.5 m (4.9 ft) high in upper reaches to about 4 m (13.1 ft) near mouth. Moderately steep to steep with slopes averaging about 35-70%.	Sandy or gravelly with gentle gradient.	Averages about 1.2 m (4 ft) at normal water. Scattered pools considerably deeper.	Velocity fairly low during normal water stages. At the Upatoi Creek gage, maximum discharge for period of record is 289 m³/sec (10,200 ft³/sec) on 15 Apr 1975. Minimum discharge is 3.0 m³/sec (106 ft³/sec) on 5, 6, 7 Oct 1970. Average discharge is 14.6 m³/sec (517 ft³/sec). (See table below for mean monthly discharges.)
Other Streams	Mostly perennial streams meandering through relatively broad valleys in unstable channels. In north, streams draining areas of crystalline rock have few meanders and valleys are narrower. Small intermittent streams form headwaters of most streams; most closely spaced in southeast. Valleys are generally narrow and incised.	High water, January through April. Low water, June through November.	Uchee Creek about 26-45.7 m (85-150 ft). Randall Creek may exceed 15.2 m (50 ft). Ochillee Creek may approach that width. Other streams narrower.	Mostly clayey sand with some silty sand. Variable height according to stream size, but generally low, up to 1.5 m (4.9 ft) and moderately steep to steep.	In north across crystalline rocks, gravel with some exposed bedrock and a moderate gradient. Elsewhere generally sandy with gentle gradient except steeper in headwaters.	Most streams about 0.6 m (2 ft) except Pine Knot and Ochillee Creeks about 0.9 m (3 ft). Uchee Creek depth affected by backwaters of Walter F. George Reservoir.	Most streams slow-flowing except in headwaters. Velocities increase in north over crystalline rocks. Pine Knot Creek has relatively high discharge from outflow of large springs, with lesser flows from Uchee Creek and Ochillee Creek.
Standing Bodies of Water							
Reservoirs (see table below)							
Wet Areas	Mostly perennial swamps with a few marshes. Many located in southwest on west bank of Chattahoochee River. Some along both banks of Upatoi Creek and many smaller streams. Some open water in oxbow lakes and behind beaver dams.	High water, January through April. Low water, June through November.	Standing water predominates over wide areas. Widths vary with high- and low-water periods.	Swamps usually merge gradually into higher terrain.	Layer of organic material, often many feet thick, on top of mostly sand and silt. Very soft bottoms.	Generally shallow water.	Water movement generally imperceptible and discharge is seldom measurable.

B. SURFACE DRAINAGE (Continued)

RESERVOIRS

MAP NO.	NAME	GRID COORDINATES	APPROXIMATE HECTARES/ACRES	STRUCTURE*
1	Bull Creek Watershed Pond	007982	13.0/32	Horizontal underdrain with vertical riser
2	Hedleys Pond	030981	3.6/9	Horizontal underdrain with vertical riser
3	Averetts Pond	139968	6.9/17	Horizontal underdrain with vertical riser
4	Snelling Pond	137942	4.9/12	Horizontal underdrain with vertical riser
5	Pope Pond	157927	2.8/7	Concrete spillway
6	Schley Pond	170817	7.7/19	Concrete spillway
7	Daniels Pond	133807	0.8/2	Horizontal underdrain with vertical riser
8	Stephens Pond	114863	3.2/8	Horizontal underdrain with vertical riser
9	Upper Kings Pond	080836	2.8/7	Horizontal underdrain with vertical riser
10	Kings Pond	067827	29.1/72	Concrete spillway
11	Clear Creek Pond	064850	5.7/14	Concrete spillway
12	Victoria Pond	039829	10.9/27	Horizontal underdrain with vertical riser
13	Weems Pond	032762	19.0/47	Concrete spillway
14	Harps Pond	989786	19.0/47	Concrete spillway
15	Twilight Pond	993841	12.1/30	Concrete spillway
16	[Armory Creek Pond]	936828	1.2/3	Concrete spillway
17	Russ Pond	917830	0.8/2	Concrete spillway
18	[Swimming Pool Pond]	917832	0.8/2	Concrete spillway
19	[Tiger Creek Pond]	983884	1.2/3	Concrete spillway
20	Kirks Pond	007893	0.8/2	Horizontal underdrain with vertical riser

* All dams are earth fill.

FORDS*

MAP NO.	GRID COORDINATES	BOTTOM	APPROXIMATE DEPTH	APPROXIMATE WIDTH	REMARKS
1	052839	Broken concrete block	0.3 m (1 ft)	3 m (10 ft)	4-wheel drive vehicles
2	085883	Gravel bed added	0.15 m (0.5 ft)	3 m (10 ft)	All vehicles
3	076957	Gravel and sand	0.6 m (2 ft)	18.9 m (62 ft)	4-wheel drive vehicles
4	088993	Gravel	0.46 m (1.5 ft)	16.2 m (53 ft)	4-wheel drive vehicles
5	132971	Gravel bed added	0.3 m (1 ft)	22.9 m (75 ft)	All vehicles
6	121942	Sand and gravel	0.91 m (3 ft)	23.5 m (77 ft)	Tanks
7	127911	Concrete	0.3 m (1 ft)	3 m (10 ft)	All vehicles. Top of culvert at low water
8	193912	Broken concrete block	0.6 m (2 ft)	7.6 m (25 ft)	Tanks. Adjacent to wooden bridge

* List shows only fords over larger perennial streams. There are many others over small, mostly intermittent streams, providing easy passage most of the year.

MEAN MONTHLY DISCHARGE (ft³/sec)*

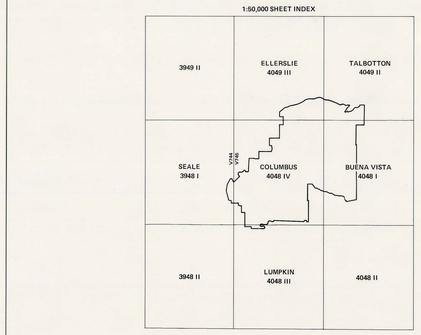
MONTH	CHATTAHOOCHEE RIVER AT COLUMBUS, GA** (AUG 1929-JAN 1976)	UPATOI CREEK NEAR COLUMBUS, GA (APR 1968-JUNE 1976)
January	9,180	712
February	10,100	794
March	11,500	868
April	10,600	826
May	6,570	381
June	4,830	285
July	4,790	277
August	4,280	275
September	3,430	204
October	3,640	184
November	4,540	201
December	6,540	428

* For conversion to cubic meters per second, multiply figures by 0.0283.
** Not located on map.

STREAM DISCHARGE MEASUREMENTS (30 Sep-3 Oct 1947 - Low Water)

MAP NO.	WATERCOURSE	DRAINAGE AREA IN SQUARE MILES ABOVE GAGE	ft³/sec	ft³/sec PER SQUARE MILE
1*	Chattahoochee River	4,670	--	--
2	Bull Creek	14.2	1.6	0.11
3	Unnamed tributary of Bull Creek	.93	0	0
4	Upatoi Creek	108	46.5	.43
5	Baker Creek	18.8	.67	.036
6	Tar River	3.0	.32	.11
7	Kendall Creek	16.0	1.7	.11
8	Cox Creek	3.3	.29	.09
9	Pine Knot Creek	67.2	78	1.16
10	Randall Creek	18.8	2.2	.12
11	Unnamed tributary of Randall Creek	.28	0	0
12	Dozier Creek	3.4	.16	.045
13	Unnamed tributary of Dozier Creek	.23	0	0
14	Randall Creek	47.2	1.4	.031
15	Randall Creek	51.4	1.9	.036
16	Long Branch	2.0	.14	.07
17	Wolf Creek	2.0	0	0
18	Unnamed tributary of Wolf Creek	2.3	0	0
19	Wolf Creek	8.5	.05	.006
20	Wolf Creek	9.3	.46	.05
21	Ochillee Creek	1.4	1.3	.094
22	Ochillee Creek	7.3	6.6	.91
23	Unnamed tributary of Ochillee Creek	1.4	2.0	.68
24	Ochillee Creek	24.2	17.8	.73
25	Ochillee Creek	37.7	17.7	.47
26	Ochillee Creek	51.7	22.5	.43
27	Steam Mill Creek	1.5	.08	.05
28	Steam Mill Creek	2.4	.43	.18
29	Tiger Creek	2.0	0	0
30	Tiger Creek	3.4	.001	.001
31	Tiger Creek	4.9	.33	.066
32	Heriot Creek	2.2	1.9	.87
33	Opossum Creek	1.3	.03	.023
34	Hamel Creek	1.5	.80	.55
35	Armory Creek	.9	.59	.66
36	Unnamed tributary of Amory Creek	.6	.17	.28
37	Upatoi Creek	447	199	.45
38	Chattahoochee River	5,230	--	--
39	Uchee Creek	340	44.1	.13
40	Shell Creek	3.4	1.22	.36
41	Hitchitee Creek	15.9	7.7	.48
42	Unnamed tributary of Hitchitee Creek	.31	.003	.01
43	Hewell Creek	4.6	.19	.042
44	Cany Creek	2.3	.01	.004

Note: For m³/sec, multiply ft³/sec by 0.0283.
For km², multiply square miles by 2.59.
For m³/sec per km² multiply ft³/sec per square mile by 0.0109.
* Off map—located at Central of Georgia Railway bridge in Columbus.



Scale 1:50,000

1 ½ 0 1 2 3 Statute Miles

1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

1 ½ 0 1 2 3 Nautical Miles

CONTOUR INTERVAL 20 FEET

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

SURFACE CONFIGURATION

1. LOW PLAINS — Predominantly flat to gently rolling in floodplains and gently to moderately rolling plains elsewhere. Local relief mainly between 25 and 45m slopes commonly 0 to 3% in floodplains and 3 to 15% elsewhere.

2. HIGH PLAINS — Predominantly moderately rolling to hillocky plains. Local relief mainly between 55 and 65m slopes largely between 8 and 15%, with valley slopes commonly 15 to 30%.

SURFACE DRAINAGE

Watercourse width*

- >25m
- 15-25m
- 10-15m
- 3-10m
- 0.3m

43.2 (142) — Bank to bank gap width, m./ (ft)*

2m / <15% — Bank height/slope, meter/percent

Swamp

15 — Stream discharge measurement

Stream gage

R5 — Reservoir

F1 — Ford

Dam

NOTE: Numbers refer to entries in tables.
* Measured at highwater; mainly perennial streams depicted.

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

C. WATER RESOURCES

1. SURFACE WATER

Adequate data for an evaluation of the volume of water available from streams are only available for the Chattahoochee River. Records for Upatoi Creek start in April 1968 and are inadequate for long-term planning. Supplementary measurements were made during the dry period of early October 1947 on some of the minor streams in or near Fort Benning (see Stream Discharge Measurements following this table). These measurements have been recalculated to give the discharge per square kilometer of drainage area and were used to develop the categories in this report. However, due to the presence of springs, variation in the thickness and permeability of sediments, and other factors it is not possible to extrapolate to other drainage areas with confidence. The measurements made during the severe drought of 1954 were evaluated but not used in developing the categories because this drought was such a rare event, possibly not recurring within 60 years or more. The points at which each category shown on the map starts and ends depend on variations in flow and move upstream or downstream reflecting daily, seasonal, or annual changes in volume. In general, the high-water period extends from January to April. Flows decrease significantly starting in June and the lowest flows may be expected in September and October.

MAP UNIT	SOURCES	QUANTITY	QUALITY	DEVELOPMENT OF SOURCES
1	Chattahoochee River, Upatoi Creek, and the lower reaches of Uchee, Ochillee, and Pine Knot Creeks are spaced variable distances apart. Most areas within the reservation are within 10 km (6 miles) of one of these sources except the extreme corners which may be as much as 16 km (10 miles), in the case of the southeast corner, from the nearest source. Streams are incised below the upland and may flow on a broad floodplain, e.g. the Chattahoochee River and Uchee and Upatoi Creeks. The Upatoi has entrenched its course where it leaves the upland to join the Chattahoochee River. The Ochillee flows in a restricted valley for 3.5 km (2 miles) as it approaches the Upatoi, and Pine Knot Creek does not have a significant floodplain within the reservation.	These streams afford more than 40,000 liters per minute (lpm) throughout the year. The minimum discharge of the Chattahoochee River at Columbus for the period of record is 499,000 lpm, for the Upatoi near Columbus, the minimum is 180,000 lpm. However, during the unusually severe drought of 1954, the Upatoi near Eelbeck, and the Uchee and Ochillee Creeks flowed less than 40,000 lpm. During periods of high water and floods, quantities are multiplied many times.	Natural surface waters are of good quality but are degraded by municipal and industrial wastes. The Chattahoochee River south of Columbus is heavily polluted. Pollution has not been reported from the other streams. Natural stream waters are soft and low in total dissolved solids. Low alkalinity and low pH indicate some corrosive action; see analyses following this table. Suspended sediment load varies with the season and is undesirably high during high-water periods and floods. Except for high iron content locally and bacterial contamination, the waters are suited for all uses after treatment.	Access to the Chattahoochee River is limited by steep banks which may be 9 to 15 m (30-50 ft) above low water. Banks on the Upatoi are low and steep, averaging 1.5 m (5 ft) in the upper reaches and 4.6 m (15 ft) in the lower reaches. Banks on the well-developed floodplains of the other streams are probably of similar height as on the Upatoi; but where floodplains are reduced or dissected, slopes may be continuous from the creeks to the upland surface. Trees, brush, and swamps hinder off-road access to streams. The flow of the Chattahoochee is regulated by dams but velocities of 0.6-0.9 m/sec (2-3 ft/sec) are reported at low-water stages. Velocities on the Upatoi and other streams will be greater, especially during high-water periods, and may be destructive to pump installations.
2	Middle reach of Randall Creek including the numerous ponds created by beaver dams, middle reach of Ochillee and the short stretch of Hichitee Creeks wherever they fall within the reservation, and the lower reach of Oswichee Creek. Most areas within the reservation are within 13 km (8 miles) of one of these sources. Streams flow on floodplains which range from 100 m (33 ft) to 1 km (0.6 mile) in width.	Minimum yields range from 4,000 to 40,000 lpm even during droughts. During high-water periods and floods, quantities of water would be much greater.	No data available for individual streams. Based on regional considerations, it is estimated that natural stream waters are soft, low in total dissolved solids, and slightly corrosive. Sources of industrial and municipal pollution are absent, but bacterial contamination may be high in ponds behind beaver dams. Suspended sediment load may be excessive during high-water periods.	Access to streams hindered by trees and brush, and in places by swamps and flooded areas caused by beaver dams. Banks are steep; bank heights are estimated to be about 1.5 m (5 ft) on the well-developed floodplains and 5 m (15 ft) or more where floodplains are restricted or incised.
3	Sources are, for the most part, south-flowing tributaries of secondary streams. However, Bull Creek and Shell Creek flow directly into the Chattahoochee River. Tiger Creek, Stream Mill Creek, Wolf Creek, Long Branch, Randall Creek, Cox Creek, Kendall Creek, Tar River, and Baker Creek are south-flowing tributaries of Upatoi Creek. North-flowing tributaries are Armory, Hamlet, and Heriot Creeks. Sally Branch is a north-flowing tributary to Pine Knot Creek. Halloca, Hollis, and two unnamed headwaters are south-flowing tributaries of Ochillee Creek. The flow in Mill Creek is continued into Harps Creek and for a short stretch in Oswichee Creek. Indicated reaches are spaced 0.6 to 7.5 km (0.4-4.7 miles) apart.	Minimum yields range from 400 to 4000 lpm even during droughts. The flow in Mill and Harps Creeks would be modified if the discharge of the sewage treatment plant at the head of Mill Creek were increased. Yields multiplied many times during high-water periods and floods.	Based on regional factors, it is estimated that natural stream waters are soft, low in total dissolved solids, and slightly corrosive. Bull, Cox, Kendall, and Baker Creeks and Tar River originate in crystalline terrain and their waters are expected to be of the same type as the waters of Kendall Creek; see analyses following this table. High organic content may be expected from ponds behind beaver dams.	Same as above.
4	Streams and associated ponds from 0.7 to 9 km (0.4-5.6 miles) apart. Most areas within the reservation are within 10 km (6 miles) of one of these sources. Streams occur on wide or narrow floodplains and in narrow valleys in the upland.	Minimum yields range from 40 to 400 lpm during low-water periods. During high-water periods, quantities may range from 400 to 40,000 lpm.	No data available for individual streams. Based on regional factors, it is estimated that natural stream waters are soft, low in total dissolved solids, and slightly corrosive. Suspended sediment load would be excessive during high-water periods. Bacterial content high in ponds.	Access to streams and ponds hindered by trees and brush, and in places by swamps and flooded areas caused by beaver dams. Banks low and steep in flat floodplains, longitudinal slopes gentle. Locally, streams incised, valley slopes steep.
5	Streams and small ponds widely distributed throughout the reservation. Not all streams that may belong within this category were mapped due to lack of data. Streams occur in narrow valleys in the upland and extend into floodplains. Streams 0.7 to 4.9 km (0.4-3.0 miles) apart. Most areas within reservation less than 5 km (3.1 miles) from one of these sources.	Minimum yields range from 4 to 40 lpm during low-water periods. During high-water periods, quantities may range from 40 to 400 lpm.	Same as above.	Access to streams and ponds hindered by trees and brush, and in places by swamps and flooded areas caused by beaver dams. Banks low and steep on floodplains, high where incised on floodplains; in narrow valleys banks continuous with valley walls, slopes may range to 45%, locally more than 45%.
6	Upper reaches of streams, generally shown as intermittent streams on topographic map. Data sparse, only representative streams mapped, stream volume and distance that the category is delineated depend on presence of springs, volume of spring flow, and volume of base flow from ground waters. Streams range from shallow drainageways on upland surfaces to steep gullies, ravines, and channels incised in the upland. Streams generally less than 0.5 km (0.3 mile) apart.	In the shallow drainageways and gullies leading from the divides, flow is present only during and for a few hours after rains. Downstream, water may persist as a trickle throughout the wet period, flow generally less than 4 lpm or water may be present as a series of pools, or the channel may be dry. Quantities are minimal nearest the divide and increase downstream, unless the stream is spring fed. In dry periods, yields reduced, most channels are dry except after infrequent rains, or if spring fed. After heavy storms or hurricanes, yields may exceed 4 lpm temporarily.	No data available for delineated stream segments. Based on regional factors, it is estimated that natural stream waters are soft, low in total dissolved solids, and slightly corrosive. Suspended sediment loads would be high downstream from gullies.	Access to streams hindered by trees and brush. Slopes gentle on divides, downstream slopes steep 30 to 45%, in places exceeding 45%.

STREAM DISCHARGE MEASUREMENTS
30 Sep-3 Oct 1947

MAP NO.	STREAM	DRAINAGE AREA ABOVE STATION sq km	sq miles	DISCHARGE l/min	ft³/sec	BASIN DISCHARGE l/min/km²	ft³/sec/mi²
1	Bull Creek	36.8	14.2	2,718.4	1.6	72.2	0.11
2	Unnamed tributary of Bull Creek	2.4	0.93	0	0	0	0
3	Dozier Creek	8.8	3.4	271.8	0.16	29.5	0.045
4	Unnamed tributary of Dozier Creek	0.6	0.23	0	0	0	0
5	Randall Creek	48.7	18.8	3,737.8	2.2	78.7	0.12
6	Unnamed tributary of Randall Creek	0.7	0.28	0	0	0	0
7	Upatoi Creek	280.0	108.0	79,002.6	46.5	282.1	0.43
8	Pine Knot Creek	174.0	67.2	132,520.0	78.0	760.9	1.16
9	Randall Creek	122.2	47.2	2,378.6	1.4	20.3	0.031
10	Randall Creek	133.1	51.4	3,228.1	1.9	23.6	0.036
11	Wolf Creek	5.2	2.0	0	0	0	0
12	Unnamed tributary of Wolf Creek	6.0	2.3	0	0	0	0
13	Wolf Creek	22.0	8.5	84.9	0.05	3.9	0.006
14	Wolf Creek	24.1	9.3	781.5	0.46	32.8	0.05
15	Long Branch	5.2	2.0	237.9	0.14	45.9	0.07
16	Tiger Creek	5.2	2.0	0	0	0	0
17	Tiger Creek	8.8	3.4	1.7	0.001	<0.7	<0.001
18	Stream Mill Creek	3.9	1.5	135.9	0.08	32.8	0.05
19	Stream Mill Creek	6.2	2.4	730.6	0.43	118.1	0.18
20	Tiger Creek	12.7	4.9	560.7	0.33	43.3	0.066
21	Opossum Creek	3.4	1.3	51.0	0.03	15.1	0.023
22	Heriot Creek	5.7	2.2	3,228.1	1.9	570.7	0.87
23	Hamlet Creek	3.9	1.5	1,359.2	0.80	360.8	0.55
24	Upatoi Creek	1,158.0	447.0	338,097.0	199.0	295.2	0.45
25	Armory Creek	2.3	0.9	1,002.4	0.59	432.9	0.66
26	Unnamed tributary of Armory Creek	1.6	0.6	288.8	0.17	183.7	0.28
27	Chattahoochee River	13,546.0	5,230.0	--	--	--	--
28	Uchee Creek	880.6	340.0	74,925.0	44.1	85.3	0.13
29	Shell Creek	8.8	3.4	2,072.8	1.22	236.2	0.36
30	Ochillee Creek	133.9	51.7	38,227.1	22.5	282.1	0.43
31	Hewell Creek	11.9	4.6	322.8	0.19	27.6	0.042
32	Ochillee Creek	18.9	7.3	11,213.3	6.6	596.9	0.91
33	Unnamed tributary of Ochillee Creek	3.6	1.4	3,398.0	2.0	446.1	0.68

ANALYSES OF SURFACE WATERS, FORT BENNING AREA*

MAP NO.	SOURCE	DATE	DISCHARGE l/sec	DISCHARGE ft³/sec	TEMPERATURE °C	TEMPERATURE °F	COLIFORMS MPN/100 ml	COLOR	pH	CONSTITUENTS IN MILLIGRAMS PER LITER (mg/l)** DISSOLVED OXYGEN	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM & POTASSIUM (Na-K)	BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	DISSOLVED SOLIDS	TOTAL HARDNESS AS $CaCO_3$
†	Chattahoochee River, Columbus, GA[1]	1940-41	104,883	3704[2]	--	--	--	9	--	--	11.0	0.05	3.9	1.3	6.1	21	4.7	3.5	0.1	1.1	44	15
7	Upatoi Creek, Box Springs, GA	1 Oct 47	1,317	46.5	17.2	63	130	9	6.0	8.4	4.6	0.37	1.0	0.4	1.1	4.0	0.7	1.5	0.1	0.2	17	4
24	Upatoi Creek, Fort Benning, GA	30 Sep 47	5,635	199.0	18.3	65	700	5	6.5	9.0	8.1	0.11	1.7	0.7	1.6	6.0	2.7	2.0	0.0	0.2	23	7
†	Kendall Creek near Upatoi, GA, about 1 km N of northern boundary of reservation	1 Oct 47	49	1.73	16.1	61	240	4	7.1	10.0	23.0	0.05	5.4	2.6	7.8	40.0	2.2	4.1	0.1	0.1	67	24
8	Pine Knot Creek near Eelbeck, GA	1 Oct 47	2,214	78.2	16.7	62	210	5	5.7	9.6	7.9	0.33	0.8	0.3	0.8	1.0	2.3	1.2	0.0	0.1	19	3
30	Ochillee Creek near Fort Benning, GA	1 Oct 47	637	22.5	18.9	66	>700	2	6.3	9.0	8.8	0.21	1.9	0.7	1.2	5.0	2.7	2.2	0.0	0.3	25	8
28	Uchee Creek near Oswichee, AL	30 Sep 47	1,252	44.2	18.3	65	29	8	6.7	9.6	9.5	0.42	4.0	1.1	2.1	15.0	3.1	2.2	0.1	0.3	36	14
†	Hichitee Creek near Cusseta, GA, about 1 km east of eastern boundary of reservation	1 Oct 47	190	6.71	18.3	65	>700	10	6.1	7.2	10.0	0.38	3.0	0.9	2.5	9.0	4.9	2.8	0.0	0.4	36	11

* Discharge measurements by US Geological Survey. Chemical analyses by G. W. Whetstone, US Geological Survey. Field examinations of temperature, coliforms, and dissolved oxygen by US Public Health Service.
** For purposes of this study, mg/l may be taken to be roughly equivalent to parts per million (ppm).
† Not on map; outside of reservation but pertinent.
[1] Average of analyses of composites of daily samples.
[2] Mean annual discharge, water year October 1940 to September 1941.

2. GROUND WATER

Abundant supplies of good quality ground water are available almost everywhere south of Upatoi Creek, but deep wells would be necessary in many places. North of Upatoi Creek, single wells, in general, would obtain only limited supplies. Conditions are suitable for the development of artesian pressure in many places in bedrock aquifers. Flowing wells may be possible from some deep wells in the southern part of the reservation, providing the wells are sited in topographically low positions. Aquifers which are at the surface in the north dip beneath the surface to the south and are progressively covered by other aquifers. The buried aquifers still yield their rated quantities of water and, in this position, may develop artesian pressure. Where more than one aquifer is present beneath the surface, wells may be deepened into underlying aquifers to increase their yield. Water levels are highest in early spring and lowest in late summer and early autumn; seasonal fluctuation may be as much as 13 ft. Shallow wells may have a reduced yield during dry periods and some may go dry. For maximum yields, wells should be sited in geologically optimum positions and should be drilled and developed by experienced personnel. Numerous springs occur throughout the reservation; most are suited only for residential use because the yield is low and subject to large seasonal fluctuations. There are only a few springs which have both an abundant and a dependable flow.

MAP UNIT	QUANTITY AND SOURCE	DEPTH	QUALITY	DEVELOPMENT OF SOURCES
1	As much as 1514 lpm * (400 gpm) available from the Tuscaloosa Formation at the northern boundary of the map unit. Quantities increase southward as the Tuscaloosa increases in thickness and is progressively overlapped by the Eutaw and Blufftown Formations. Wells tapping all available aquifers may have a combined yield of 2650 lpm (700 gpm). Producing aquifers in the Tuscaloosa are massive beds of loose to poorly consolidated gravel, and coarse to fine sand; in the Eutaw and Blufftown, the aquifers are lenses and well-stratified beds of coarse, porous, and permeable sand (see Logs of Selected Wells below). Aquifers interbedded with nonwater-yielding sedimentary deposits. Well yields dependable, not subject to seasonal fluctuations. Pumping tests are not available for wells in the study area. However, elsewhere in Georgia, tests of some sand beds of the Tuscaloosa have measured coefficients of permeability as high as 2600 gpd/ft² (105,939.6 lpd/m²). In the Savannah River basin, transmissibility for the Tuscaloosa Formation averaged 200,000 gal/day/ft (2483.8 m³/m). Some springs in the outcrop areas of the Eutaw and Blufftown Formations support ponds throughout the year but for the most part, springs do not have significant yields and are subject to large seasonal fluctuations.	The Tuscaloosa Formation is generally about 121.9 m (400 ft) thick along the northern boundary of the map unit but may be only 91.4 m (300 ft) thick in places. Toward the south the formation thickens. The Eutaw Formation ranges from 30-61 m (100-200 ft) and is in turn overlain by the Blufftown Formation which ranges between 10.7-45.7 m (35-150 ft). A well penetrating the total thickness of these formations would have to be 228.6 m (750 ft) deep in order to obtain maximum yields. All formations thicken toward the south and wells near the Chattahoochee River have been reported as deep as 457 m (1500 ft). Details on the pumping levels and drawdown of wells are not available.	In the Tuscaloosa Formation, the water is uniformly excellent; pH about 7.0, low in total dissolved solids, and suitable for all uses. In places the iron content is high (see table of chemical analyses below). In the Eutaw and Blufftown Formations, the dissolved mineral content is higher but the water is still suited for most uses; silica, calcium, and sulfate are the high constituents; pH is about 6.0. The iron content is excessively high in many places, as much as 4 milligrams per liter (mg/l). ** The Blufftown Formation contains some beds with gypsum crystals which could contribute an undesirably high sulfate content to the water. However, these beds are not used as water sources. All shallow wells should be curbed and protected from surface contamination.	For maximum yields, drilled wells are necessary to tap deeper water-bearing sands and gravel, gravel packing useful opposite sand aquifers. Screens required, especially opposite the finer sand aquifers of the Eutaw and Blufftown Formations. Deeper aquifers under artesian pressure, some flowing wells may be developed in the south where deep wells are sited on valley bottoms or floodplains. Shallow-dug wells 0.6 m (2 ft) in diameter should be sited on valley bottoms or lower slopes of valleys. They are productive, but yields are small and subject to large seasonal fluctuations.
2	In general, wells in alluvium would yield from less than 37.8 to as much as 378 lpm (> 10-100 gpm) depending on the thickness of the alluvial section. Under favorable conditions, where hydrologic continuity in thick permeable deposits exists between the well and the nearby stream, as much as 1514 lpm (400 gpm) may be pumped. Aquifers consist of porous and permeable fine to coarse sand and lesser amounts of gravel interbedded with silt; deposits are irregularly bedded, lenticular, and in places well stratified. The broad floodplain of the Chattahoochee River is 9 to 15 m (30-50 ft) above the present river level and is being replaced by a new floodplain a few meters above the present river. Wells on the older floodplain tap the water table above the river and afford limited supplies. Wells on the alluvium that extend below river level and establish hydrologic continuity with the river yield much larger quantities of water, but are limited by the thickness of the section that is saturated by the river water. Hence, larger yields may be expected by wells in the floodplains of the larger creeks because the creeks are flowing at a higher level than the Chattahoochee and saturate a thicker section of alluvium. Water level in wells in continuity with streams would fluctuate in response to changes in stream levels. Levels in water table wells in the older alluvium of terraces would reflect seasonal climatic variations more distinctly. Except for the large spring which supplies the swimming pool at the main post, yields from springs in alluvium are not dependable for permanent supplies.	Porous permeable deposits throughout the complete section of alluvium are uncommon. Maximum thickness of the alluvium is about 12 m (40 ft) on the old floodplain of the Chattahoochee River and in the floodplains of the larger creeks. About 4.6 m (15 ft) of alluvium is present in the recent floodplain of the Chattahoochee River. Saturated alluvial deposits are thicker in the larger creek valleys. Detail maps are not available, and precise thickness at any point cannot be predicted without exploration.	Ground water is of excellent quality and is similar, in general, to quality of the water in the nearby stream. Shallow wells should be monitored for possible ground water pollution and be protected from contamination from surface sources.	Shallow-dug or driven wells suitable for obtaining small supplies. Larger supplies possible from batteries of driven wells or by developing a well field. Alluvium generally not of sufficient thickness for development of infiltration galleries.
3	North of Upatoi Creek yields may be as much as 189.3 lpm (50 gpm). In general, yields decrease toward the north as the Tuscaloosa Formation becomes thinner and yields may be as low as 18.9 to 56.8 lpm (5-15 gpm) near the northern boundary. Producing aquifers are stringers, lenses, and massive beds of loose to poorly consolidated gravel and coarse sand interbedded with well-consolidated layers of fine sand and clay. Yields are dependable except near the northern boundary where production is low and subject to seasonal fluctuation. Springs and hillside seeps in places are generally not dependable. For aquifer characteristics, see Map Unit 1, above.	Detailed data on the depth of wells in the Tuscaloosa aquifer are not available. It is known that the Tuscaloosa thickens toward the coast and ranges from 91-122 m (300-400 ft) in thickness in the vicinity of Upatoi Creek. No definitive data are available on thickness at the northern boundary of the area, but the Tuscaloosa is estimated to be between 9-18 m (30-60 ft) thick. Production would depend on presence of a coarse sand or gravel bed. In the north, wells of greater depth would penetrate the crystallines and would have little chance of improving yield.	Water suitable for all uses, soft; quality uniformly excellent; pH generally about 7.0; iron content rarely exceeds 0.2 mgl; low in total dissolved solids.	In the north, the Tuscaloosa is mainly on the divides; dependable supplies generally are not available until wells approach the level of adjoining valley bottoms. Locally on these divides, lenticular aquifers may give rise to perched water supplies which are generally subject to large seasonal fluctuations. Perched water supplies cannot be predicted without preliminary exploration. Southward, the Tuscaloosa becomes thicker, extends below the valley bottoms, and affords dependable supplies. Dug, driven, or jetted wells adequate for shallow sources; dug wells will require curbing, jetted wells will require casing to prevent collapse of loose or weakly consolidated sediments. Drilled wells necessary to tap deeper water-bearing sands and gravel; gravel packing and screens may aid recovery from finer sands.
4	Yields commonly range from less than 4 to about 40 lpm (< 1-10 gpm). Under fortuitous conditions yields may exceed 40 lpm (10 gpm), but many wells produce less than 4 lpm (1 gpm). In the north, water is obtained from granitic and foliated rocks which form the crystalline basement complex. Fresh bedrock is dense and impermeable; water occurs in fracture zones; yields difficult to predict, depend on water-storing capacity of fracture openings, extent, interconnection of the fracture system, and the number of such fractures intercepted by a well. Weathered rock is clayey or sandy, water occurs in the more permeable zones. In the south, water obtained from sedimentary aquifers in the Cusseta and Ripley Formations. The water-bearing beds are loose to poorly consolidated permeable sands and gravel, and calcareous sandstone interbedded with clayey sand, impermeable clays, thin ironstone bands, and other impermeable rocks. In the north, supplies from the crystalline bedrock are fairly dependable but subject to some seasonal fluctuations in level. In the south, aquifers near the top of ridges are not dependable; the aquifers lose ground water readily through hillside seeps. Aquifers on lower slopes of hills or below valley bottoms dependable but subject to some seasonal fluctuation in level. In general, deeper aquifers have larger yields, and in the southeast, may have a slight artesian head. Springs of low yield issue from the Cusseta Sand, generally at the contact with an underlying impermeable formation.	In the north, wells in the weathered unconsolidated crystalline residuum and underlying fresh rock have a potentially great range in depth. Shallow wells possible in sandy permeable zones of unconsolidated residuum. Wells extending into bedrock depend on water stored in open fractures for production. Fractures tend to close with depth; and in practice, wells in the crystalline bedrock generally are not drilled beyond 100 m (328 ft). In the south, wells in the Cusseta Sand may be as much as 61 m (200 ft) deep. Where the Ripley Formation forms the surface, wells may be as much as 91 m (300 ft) deep. Wells extended into the underlying Blufftown, Eutaw, and Tuscaloosa aquifers (Map Unit 1) may be much deeper.	In the north, water from the crystallines is generally of good quality suited for all uses. The water is soft, total hardness generally does not exceed 60 to 70 mgl and is low in total dissolved solids; locally, iron and manganese may be present in objectionable amounts. In the south, except for undesirable amounts of iron in places, the water is generally suitable for all consumptive uses. It is relatively low in total dissolved solids and low in hardness. Shallow wells should be protected from contamination by surface sources.	In the north, dug wells may be used at shallow depths in the weathered crystalline rocks but yields will be scanty. In places, digging may be halted by ledges of undecomposed tough hard rock. Cable tool or rotary drilling required for deep wells; casing would be needed in the surficial unconsolidated material and in the weathered bedrock. Yields determined primarily by the number and character of openings intersected by the drill hole. In the south, wells dug, driven, or jetted to shallow depths in the Cusseta Sand may produce adequate supplies. Deep wells in the Cusseta or wells started in the Ripley Formation and extended into the underlying formations should be drilled. Drilled wells should be cased and screened; improved yields may be obtained by gravel packing, especially in the finer sands.

* lpm = liters per minute, gpm = gallons per minute, and m³/m = cubic meters per meter.
** For purposes of this study, mg/l may be taken to be roughly equivalent to parts per million (ppm).

LOGS OF SELECTED WELLS AT FORT BENNING

Wells are referenced by Map Number this study, identified by county, and by Georgia Geological Survey (GGS) number. Well citation and description of the log are as published in Georgia Geological Survey Bulletin No. 70, 1961. Where the top of the geologic interval could not be determined from the samples, the designation **In** as **In Tuscaloosa** was used.

WELL NO. 3*

Location: Near elevated steel reservoir, Harmon Church, Fort Benning Military Reservation — Chattahoochee County GGS Well No. 18 Elevation: 445 ft

Owner: US (Army) Govt.

Driller: Layne-Atlantic Company

	Thickness and Depth m	ft
Upper Cretaceous: Blufftown and Eutaw Formations (Undifferentiated):		
Sand: fine- to medium-grained, angular, limonitic, micaceous	18.2- 18.2	60- 60
Sand: as above; some clay, lignitic, micaceous	18.2- 36.6	60-120
Clay: gray to light-brown, lignitic, micaceous, fossiliferous (macroshells)	42.7- 79.2	140-260
Sand: fine- to coarse-grained, crystals of calcium sulfate	12.2- 91.4	40-300
Clay: as above, but becoming somewhat mottled at depth; interbedded sand, fine- to coarse-grained, angular, gypsiferous	28.7-120.1	94-394
In Tuscaloosa Formation:		
Sand: fine- to coarse-grained, angular, arkosic	27.4-147.5	90-484
Summary:		
Upper Cretaceous (Blufftown and Eutaw Formations, Undifferentiated)	120.1-120.1	394-394
In Upper Cretaceous (Tuscaloosa Formation)	27.4-147.5	90-484
Potential Water-Bearing Zones:		
Sand: fine- to coarse-grained	12.2- 91.4	40-300
Sand: fine- to coarse-grained	12.4-132.6	41-435

Remarks:

Ground water derived from water-bearing sand at depth 260-300 ft is probably mineralized on account of the included crystals of calcium sulfate.

* Location approximate.

WELL NO. 4*

Location: South side of Upatoi Creek, west side of Engineering Building, Fort Benning Military Reservation — Chattahoochee County GGS Well No. 332 Elevation: 240 ft

Owner: No. 1 Fort Benning Engineering School

Driller: Layne-Atlantic Company

Drilled: November 1952

	Thickness and Depth m	ft
Upper Cretaceous: Eutaw Formation:		
Sand: yellow, fine- to medium-grained, argillaceous	1.5- 1.5	5- 5
Sand: as above; some clay, gray, micaceous	3.0- 4.6	10- 15
Sand: fine- to coarse-grained, angular, somewhat arkosic	8.2-12.8	27- 42
Tuscaloosa Formation:		
Kaolin: gray to somewhat mottled at depth, micaceous, sandy	9.8-22.6	32- 74
Sand: fine- to coarse-grained, angular, arkosic, micaceous; interbedded clay, gray to pale-green, somewhat waxy, micaceous	71.0-93.6	233-307
Summary:		
Upper Cretaceous (Eutaw Formation):	12.8-12.8	42- 42
Upper Cretaceous (Tuscaloosa Formation):	80.8-93.6	265-307
Potential Water-Bearing Zones:		
Sand: coarse-grained	6.4-50.6	21-166
Sand: coarse-grained	8.2-64.9	27-213
Sand: coarse-grained	11.9-93.6	39-307

Remarks:

On the basis of other knowledge of this area, it is felt that even better water-bearing sands occur at depths below total depth of above well.

* Location approximate.

PRODUCING WELLS AT FORT BENNING

Wells yielding 38 to 57 liters per minute (10-15 gallons per minute) supply water to the following outlying training and recreation areas. Wells sited in alluvium and the Cusseta Sand may extend into and produce from the underlying aquifers. Depths, diameter, water levels, pumping, and other data on the wells are not available.

MAP NO.	GENERAL LOCATION*	GROUND WATER UNIT
1	TIC Rest Camp	2
2	Kings Pond Recreation Area	1
7	Uchee Creek Recreation Area	2
8	Kunzig Range	1
15	Camp Darby	4

* Only approximate locations are available for the wells.

CHEMICAL ANALYSIS OF GROUND WATER IN THE FORT BENNING AREA
(In milligrams per liter except for color and pH)

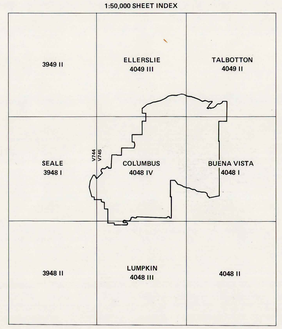
WELL NO.	5[a]	6[c]	9[c]	10[c]	11[c]	12[b]	13[c]	14[c]
UNIT TAPPED	1	1	1	1	1	1	1	1
Silica (SiO_2)	28	20	5.2	--	6.4	20	48	40
Iron (Fe)	.16	.20	.6	14	1.2	.1	5.4	1.8
Calcium (Ca)	15	11	2.7	--	2.1	11	11	23
Magnesium (Mg)	.6	[d]	.1	--	.6	[d]	.0	.0
Sodium (Na)	26	[d]	2.8	--	--	[d]	--	14
Potassium (K)	--	[d]	--	--	--	[d]	--	--
Carbonate (CO_3)	3.0	--	--	--	--	--	--	--
Bicarbonate (HCO_3)	86	81	--	--	--	71	--	--
Sulfate (SO_4)	8.3	5.0	5.0	--	14	10	22	28
Chloride (Cl)	8.5	3.0	2.6	--	3.5	3.0	2.2	3.0
Fluoride (F)	.3	.0	--	--	--	.0	--	--
Nitrate (N)	.0	.0	6.0	--	--	.0	--	--
Dissolved solids	132	100	32	--	41	39	--	--
Hardness as $CaCO_3$	40	28	7	--	8	28	28	56
Suspended matter	--	.0	--	--	--	.0	--	--
Free CO_2	--	3.0	9.5	12	16	4	--	--
pH	8.2	7.	4.8	7	5.5	6.9	5.4	6.9
Color	3	--	--	--	--	--	--	--

[a] Analyzed by W. L. Lamar, US Geol. Survey, Raleigh, NC.
[b] Analyzed by L. H. Turner, Georgia State Chemist.
[c] Analyzed by Water Works Chemist at Fort Benning.
[d] Trace.

SPRINGS

MAP NO.	YIELD	DATE MEASURED	REMARKS
1	25 gpm	25 Feb 1953	Yield from Tuscaloosa Formation and possibly overlying terrace deposits. Unused.
2	2374 gpm	12 Feb 1953	Yield from older terrace gravel at contact with underlying Eutaw Formation. Supplies water to nearby swimming pool.

1:50,000 SHEET INDEX



Scale 1:50,000

1 ½ 0 1 2 3 Statute Miles

1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

1 ½ 0 1 2 3 Nautical Miles

CONTOUR INTERVAL 20 FEET

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

WATER RESOURCES

SURFACE WATER

FRESH WATER PERENNIALLY PLENTIFUL

1. Enormous* quantities available from the Chattahoochee River and the lower reaches of some secondary streams.
2. Very large quantities available from widely spaced stretches of some streams during low-water periods, quantities increased during high-water periods.
3. Large quantities from stream stretches spaced 0.6-7.5 km apart, quantities increased during high-water periods.

FRESH WATER SEASONALLY PLENTIFUL

4. Moderate quantities available from stretches 0.7-9 km apart during low-water periods; large to very large quantities available during high-water periods.

FRESH WATER SCARCE

5. Small quantities available from minor tributaries 0.7-4.9 km apart during low water stage; moderate quantities available during high-water periods.
6. Meager quantities available during dry season from headwaters of streams generally less than 0.5 km apart, frequently dry; may have continuous small trickle in high-water periods; only representative streams mapped.

Location of single discharge measurement Sept. 30-Oct. 3, 1947.

U. S. Geological Survey gaging station.

Except for point discharge measurements, the data portrayed on this map are based on subjective evaluations without support of long period records.

*NOTE: Definition of underlined terms are as follows:

Volume Terms	Liters Per Minute (lpm)	Gallons Per Day (gpd)
Enormous	>40,000	>15,000,000
Very large	4,000-40,000	1,500,000-15,000,000
Large	400-4,000	150,000-1,500,000
Moderate	40-400	15,000-150,000
Small	4-40	1,500-15,000
Meager	<4	<1,500

USER NOTE: For permissible concentrations of impurities in military water supplies, see Field Water Supply, TM 5-700, July 1967, paragraph 19, or other applicable manuals or regulations.

GROUND WATER

FRESH WATER GENERALLY PLENTIFUL

1. Moderate to large quantities from thick sections of sands and gravels.

FRESH WATER LOCALLY PLENTIFUL

2. Small to large quantities from alluvium.
3. Small to moderate quantities from thin sections of sands and gravels.

FRESH WATER SCARCE OR LACKING

4. Meager to small quantities from sedimentary sequences of varied deposits, and from deeply weathered crystalline rocks.

Well.

Spring.

NOTE: Definition of underlined terms are as follows:

Volume Terms	Liters Per Minute (lpm)	Gallons Per Day (gpd)
Large	400-4,000	150,000-1,500,000
Moderate	40-400	15,000-150,000
Small	4-40	1,500-15,000
Meager	<4	<1,500

USER NOTE: For permissible concentrations of impurities in military water supplies, see Field Water Supply, TM 5-700, July 1967, paragraph 19, or other applicable manuals or regulations.

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1970.

D. ENGINEERING SOILS

SOIL CHARACTERISTICS AND SELECTED EVALUATIONS

This table and the accompanying soils map are generalized, but the information is considered to be fairly reliable for general planning and for an understanding of some of the basic conditions of the area. It is intended to guide, but not to supplant, detailed investigation of sites for specific uses.

The map is based primarily on Source 1, supplemented from some more recent information from Source 3. Some of the soils have been redefined and renamed through the years, which accounts for some of the differences in the names of the soil series used in various sources.

Soils have been grouped into eight map units, based primarily on having the same general engineering characteristics. Each unit has been evaluated for its limitations (slight, moderate, or severe) for seven common engineering applications, together with the main characteristics causing the limitations, as explained in the legend at the bottom of the table. The soil profiles are very general and are "average" typical profiles; actual conditions may vary to some extent, especially the thickness of the layers. The lower layer of the typical soil profiles as shown in the table consists primarily of stratified alluvial sands, silts, clays, and mixtures that cannot be differentiated and given any specific USCS classification.

Fort Benning is located in the Coastal Plain physiographic province, very near the edge of the Piedmont Plateau. The soils are derived primarily from the unconsolidated sand and clay beds of the Coastal Plain. The Piedmont has had its effects on the soils of Fort Benning, however, since much of the alluvium has been and continues to be washed down from the Piedmont and deposited on the Coastal Plain. The micaceous soils, for example, were derived from the Piedmont rocks. Depth of the unconsolidated materials usually extends down to the underlying rock, which is over 2 meters below the surface throughout the post. Generally, it is many tens of meters to bedrock. The rock is most likely to be closer to the surface at the northern edge of the area.

The Fort Benning region is mantled predominantly by deep, poorly graded sands (Unit 1), with a clayey subsoil (Unit 2) present in many places. These soils are well drained, some even excessively drained. Any difficulty in movement across these areas would be caused by the sand being loose and dry rather than wet. The deep sand takes the form of dune sand in a large area between Pine Knot and Upatoi Creeks in the east and another area near Lawson Field in the west. Highly plastic clay (Unit 3) without any mantle of sand is found on much of the southern part of the post, east of the Chattahoochee River.

Floodplain deposits consist primarily of well-drained sandy silt (Unit 6) which is occasionally flooded and the generally poorly drained clayey sand (Unit 5) which is frequently flooded. Other variations in texture are also found, including small sandbars. There are low, poorly drained terraces consisting of clayey sand or lean clay (Unit 4). Silty sand (Unit 7) materials are found on floodplains and low terraces, occasionally flooded; surface drainage is poor, but internal drainage is fairly good.

The southeastern corner contains some severely dissected surfaces (Unit 8) where much of the original topsoil has eroded away, leaving exposed materials varying from coarse sand to clay. These varied materials have not been differentiated. The gullies themselves present the greatest problem in the utilization of this land for engineering purposes.

MAP UNIT	MAJOR SOIL SERIES[1]	GEOGRAPHIC SETTING	TYPICAL SOIL PROFILE[2] —LAYERS, THICKNESS OF LAYERS, DEPTH TO ROCK, UNIFIED ENGINEERING CLASSIFICATION[3] (PROFILES NOT TO SCALE)	HIGH-WATER TABLE (DEPTH AND DURATION)	PERMEABILITY	SHRINK-SWELL POTENTIAL	RATING AND MAJOR KINDS OF LIMITATIONS FOR: SEWAGE LAGOONS	SANITARY LANDFILL	FOUNDATION FOR SMALL BUILDINGS	ROAD LOCATION	SHALLOW EXCAVATION	TRAFFICABILITY	BIVOUAC SITES	REMARKS
1	Lakeland Troup	Well-drained sandy soils on level to hilly Coastal Plain upland. Slopes are commonly 0 to 12 percent but may range to 30 percent.	cm 150: SP, SM — Yellowish-brown, poorly graded sand, loose, single-grained. Depth from 75 to 225 cm (30-86 in.); Layered deposits or mixtures of sand, gravelly sand, silty sand, clayey gravel, sandy clay, and micaceous clay	< 1.8 m	15 cm/hr (6 in./hr)	Very low	Severe (s, h)	Severe (s, h)	Slight	Moderate (s)	Severe (c)	Moderate (k)	Moderate (k)	Some small areas have 50 to 100 cm (20-39 in.) of poorly graded sand over silty sand.
2	Orangeburg Dothan Ailey	Gently undulating to hilly, moderately broad upland ridges and stream terraces. Slopes from 0 to 15 percent.	cm 40: SP, SM — Poorly graded fine sand, gray to reddish-brown; 100: CL, SC — Sandy clay, red, brown, or yellow, low plasticity; Layers or mixtures of sand, silt, clay, and gravel	< 1.8 m	5-15 cm/hr (2-6 in./hr)	Low	Moderate (h, s)	Slight	Moderate (h)	Moderate (h)	Moderate (h)	Moderate (k)	Moderate (k)	May be some perched water tables in Dothan soils which could cause wetness problems for foundations and sanitary landfills.
4	Roanoke Leaf	Low, poorly drained stream terraces, occasionally flooded. Slopes less than 2 percent.	cm 100: SC, CL — Brownish-gray clayey sand or lean clay, varies from 50 to 150 cm (20-59 in.) thick; Stratified alluvial deposits of sand, silt, and clay	0.3 m Nov-May	0.15-0.5 cm/hr (0.06-0.2 in./hr)	Moderate to high	Slight	Severe (f, w)	Severe (f, t, w)	Severe (f, t, w, a)	Severe (f, w, b)	Moderate (w, f)	Severe (f, p, w)	Soil is waterlogged much of the winter and spring.
5	Bibb Chewacla Rains	Poorly drained floodplains along larger streams, frequently flooded. Slopes are less than 2 percent.	cm 120: SC — Alluvial deposits of clayey sand with some layers of sand and silt, ranges from 75 to 150 cm (30-59 in.) in depth; Alluvial deposits of sand, silt, and clay	0.3 m Nov-Apr	0.15-0.5 cm/hr (0.06-0.2 in./hr)	Low	Severe (f, w)	Severe (f, w)	Severe (f, w)	Severe (f, w)	Severe (w, f)	Moderate (w, f)	Severe (w, f)	Mostly forested. Trafficability is fair when not waterlogged.
6	Ochlockonee Toccoa	Well-drained floodplains, occasionally flooded. Slopes are 0 to 2 percent.	cm 110: ML — Stratified alluvial material, mainly brown fine sandy silt; Stratified alluvial deposits of sand, silt, clay, and some gravel	1.0 m Dec-Apr	5.0-15.0 cm/hr (2.0-6.0 in./hr)	Low	Severe (f, s)	Severe (f)	Severe (f)	Severe (f)	Severe (f)	Moderate (f)	Severe (f)	Drains fairly rapidly as water table recedes. Trafficability is poor when wet. Contains some mica.
7	Augusta Ochlockonee	Poorly to well-drained floodplains and low terraces, occasionally flooded. Slopes 0 to 2 percent. Relief 4 to 8 ft.	cm 25: SP — Poorly graded brown fine sand, some organic matter and mica; 100: SM, ML — Brown micaceous silty sand; Layered alluvial deposits of sand, silt, and some gravel	0.6 m Dec-May	5.0-15.0 cm/hr (2.0-6.0 in./hr)	Low	Severe (f, s, w)	Severe (f, w)	Severe (f, w)	Severe (f, w)	Severe (f, w)	Moderate (f, w)	Severe (f, w)	Trafficability fair when not flooded.
3	Susquehanna Duplin Esto	Gentle to steep slopes of narrow to wide dissected ridges, plus small dissected areas on high terraces. Relief 5 to 100 ft. Slopes 2 to 15 percent.	cm 100: CH — Highly plastic clay, generally reddish with some mottling; Micaceous silt, clay, and sandy clay with lenses of sand	> 1.5 m	0.15-0.5 cm/hr (0.06-0.2 in./hr)	Moderate	Moderate (h)	Moderate (h, b, w)	Moderate (a)	Severe (a, t)	Moderate (b, w)	Severe (x, y)	Moderate (p, h)	Sticky when wet.
8	— (Rough, gullied land)	Rolling to very steep narrow ridges, severely dissected. Relief 10 to 100 ft or more. Many slopes are 30 to 45 percent, some greater.	Original topsoil, subsoil, and part of material under subsoil have been eroded away. Material exposed varies from coarse sand to clay, not differentiated.	> 1.8 m	Variable	Variable	Severe (h)	Severe (h)	Severe (h)	Severe (h)	Severe (h)	Severe (h)	Severe (h)	Although engineering suitability of soils depends on kind of soil exposed, the gullies themselves present the greatest problem in utilization of these areas.

[1] Soils that have profiles almost alike make up a soil series. The series is the common name of the soil. Each series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Many other minor soils are included in the map unit.

[2] These are typical average layers, and thicknesses may vary considerably from those shown. Depth to rock exceeds 2 m, generally much more than this.

[3] The **Unified Soil Classification System,** Technical Memorandum No. 3-357, US Army Corps of Engineers, March 1953.

Data for the Engineering Soils Map and this table came from various sources, published and unpublished. Major source items include the following:

(a) **Terrain Study of Fort Benning and Vicinity,** Engineer Intelligence Study, EIS 211, Office, Chief of Engineers, Department of the Army, June 1958.

(b) **Soil Survey of Muscogee County, Georgia,** Phillips, S.W., and Sweet, A. T., US Department of Agriculture, Bureau of Soils, 1926.

(c) **General Soils Map (Soil Associations) of Fort Benning Military Reservation,** unpublished, prepared by John Johnson, US Department of Agriculture, Soil Conservation Service, 1976.

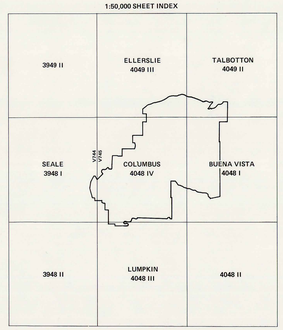
DEFINITIONS OF RATING TERMS

SLIGHT—relatively free of limitations, or limitations are easily overcome.
MODERATE—limitations can be overcome with good planning and/or careful design.
SEVERE—limitations are serious and are difficult to overcome.

SOIL RELATED PROPERTIES AFFECTING LIMITATIONS

a—High shrink-swell potential
b—Too clayey
c—Cutbanks cave
f—Flooding
h—Slope
k—Loose sand
p—Slow permeability
s—Seepage (porous soil)
t—Low bearing strength
w—Wetness
x—Slipperiness
y—Stickiness

1:50,000 SHEET INDEX



Scale 1:50,000

1 ½ 0 1 2 3 Statute Miles

1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

1 ½ 0 1 2 3 Nautical Miles

CONTOUR INTERVAL 20 FEET

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

ENGINEERING SOILS

SOILS OF THE COASTAL PLAIN UPLAND

1 Deep, poorly graded sandy soils; well to excessively drained.

2 Poorly graded sandy soils on clay; includes some stream terraces.

3 Highly plastic clay soils on dissected, well drained surfaces.

SOILS OF ALLUVIAL FLOOD PLAINS AND TERRACES

4 Low, poorly drained terraces; mainly clayey sand or lean clay, waterlogged in winter and spring.

5 Poorly drained flood plains; clayey sand with sand and silt. Waterlogged in winter and spring.

6 Well drained flood plains; stratified material, primarily fine sandy silt.

7 Poorly to well drained flood plains and low terraces consisting of silty sand with some organic matter and mica.

STEEP SOILS

8 Rough, gullied land, generally steep, where original soil has eroded away. Varied materials, undifferentiated.

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

E. ENGINEERING GEOLOGY

The predominant earth materials of the Fort Benning area are layered, unconsolidated, poorly to well-compacted mixtures of clay, silt, sand, and gravel. These materials comprise seven different major geologic formations resting on a basement of consolidated crystalline rock. Outcrops of consolidated rock are extremely limited and confined mainly to the crystalline basement complex in the north part of the area and to scattered layers and lenses in the layered unconsolidated sediments.

A zone extending from the land surface to an average depth of 50 ft, exclusive of the uppermost few feet of topsoil and subsoil, is believed to represent a depth adequate for most engineering works in this area for it includes the substratum, all unconsolidated materials comprising the geologic formations, and, in places, limited amounts of consolidated bedrock. Within this zone, however, no attempt has been made to evaluate the detailed and specialized problems or the geologic conditions concerned with the construction of dams, railroad alinements, tunnels, deep underground installations, and demolition characteristics. Detailed data applicable to the upper 4 to 5 ft of topsoil and subsoil are considered in greater detail in the Engineering Soils section.

This engineering geology topic is based on detailed field investigations of each geologic formation. It presents a summary of data obtained by examination of more than 200 exposures as well as detailed sections of borrow pits, quarries, and road cuts, totalling 91 different sites. At each exposure, a field examination was made to determine thickness and lateral extent of the various layers, gradation, mineralogical composition, associated landforms, angle of repose and observed slopes of excavation, methods and facility of excavation, relative ease of erosion and gully formation, thickness and character of overburden soil, and pertinent drainage and groundwater conditions.

Field examination of the geologic formations of the Fort Benning area made it possible to transform them to engineering geology units by combining those of similar character. Eight engineering geology units have been derived from the nine geologic units present within the limits of Fort Benning. Of these eight, five units represent distinct geologic formations and three represent combinations of similar geologic formation. Table 1, below, contains capsule evaluations for each of the eight geological formations in the study area. The primary factors utilized in the derivation of the engineering geology units from the geologic formations were: nature and degree of consolidation, gradation, layering, compaction of the dominant materials exposed in an observed strata of each formation, engineering properties and use, mineralogical composition, and geologic origin and geographic distribution. Descriptive unit names are used to stress certain distinctive features of composition, layering, gradation, or origin. The Engineering Geology Map, therefore, is a special purpose map based on geology and engineering characteristics of the earth materials.

TABLE 1. ENGINEERING GEOLOGY

MAP UNIT	TOPOGRAPHY	ROCK DESCRIPTION	PHYSICAL CONSTANTS* (SELECTED SAMPLES)	ENGINEERING EVALUATIONS**	EXCAVATION FACTORS**	PITS AND QUARRIES
1. Alluvium	Valley lowlands, bottomlands and floodplains; sand and gravel bars; some rejuvenated streambeds on upland crystalline rocks; many point bar deposits along present major streams and along inside bends of old meander scars; low younger terraces.	Dominant material: mixtures of clay, silt, and sand. Floodplains contain layers, lenses, or mixtures of clay, silt, sand, and gravelly sand. Low terraces contain more gravelly sand. Sand: Chiefly angular quartz, some feldspars and mica, minor amounts of dark materials, and heavy minerals. Gravel: Subangular to rounded milky quartz and quartzite; average maximum size 51 mm (2 in.).	Gravelly sand (Sample Site No. 17)— **Sieve analysis:** Cumulative percent passing[1] 1-1/2″ (98); 1″ (90); 3/4″ (82); 1/2″ (73); 3/8″ (66); #3 (60); #4 (52); #8 (47); #10 (30); #40 (15); #60 (7); #200 (3). **Silt:** 1% **Clay:** 2%[2] **Volume change:** 0.4% **Specific gravity—** Apparent: (gravel) 2.66; (sand) 2.62 Bulk (dry): (gravel) 2.61; (sand) 2.50 Bulk (ssd): (gravel) 2.63; (sand) 2.55 **Absorption:** (gravel) 0.6%; (sand) 1.85% **Max. density:** 1778 kg/m³ (111 lb/ft³) **Optimum moisture:** 11% **Compressive strength seven days:** Standard (average): 191.57 kg/cm² (2725 lb/in.²) Sample (average): 196.85 kg/cm² (2800 lb/in.²) Strength ratio: 103% **Soundness 5 ~ Na_2SO_4 loss:** 0.48% **Los Angeles abrasion test, 500 revolutions:** 42.9% loss **Supplementary data on testing procedure:** Abrasion and sp gr (gravel) on material retained 9.5 mm (3/8 in.). Sp gr (sand) on material passing #3. Soundness loss is weighted avg for all sizes passing 63 mm (2-1/2 in.), retained 9.5 mm (3/8 in.). Compressive strength and colorimetric on passing #3, washed on #200. Physical test constants, density, and moisture on unwashed material passing #10. **Remarks:** Composite channel sample from 6.1 m (20 ft) pit face; very low clay content. For overlying clayey layers, see Sample 16 from adjacent pit. Gravelly sand (Sample Site No. 6)— **Sieve analysis:** Cumulative percent passing[1] 1-1/2″ (97); 1″ (89); 3/4″ (83); 1/2″ (77); 3/8″ (71); #3 (69); #4 (62); #8 (50); #10 (34); #40 (8); #60 (2); #200 (T)[3]. **Specific gravity—** Apparent: (gravel) 2.66; (sand) 2.60 Bulk (dry): (gravel) 2.63; (sand) 2.48 Bulk (ssd): (gravel) 2.65; (sand) 2.53 **Absorption:** (gravel)0.3%; (sand) 1.85% **Maximum density:** 1633.84 kg/m³ (102 lb/ft³) **Optimum moisture:** 12% **Compressive strength seven days:** Standard (average): 191.57 kg/cm² (2725 lb/in.²) Sample (average): 177.51 kg/cm² (2525 lb/in.²) Strength ratio: 93% **Soundness 5 ~ Na_2SO_4 loss:** 6.24% **Los Angeles abrasion test, 500 revolutions:** 49.9% loss **Supplementary data on testing procedures:** Abrasion and sp gr (gravel) on material retained 9.5 mm (3/8 in.). Sp gr (sand) on material passing #3. Soundness loss is weighted avg for all sizes passing 51 mm (2 in.), retained 9.5 mm (3/8 in.). Other tests on material passing #3. **Remarks:** Composite channel sample, surface to 0.91 m (3 ft), gravel bar in Randall Creek. No overburden. Represents many small bars in area; elsewhere unit usually contains less gravel, more sand and clay.	Straight alinements with minimum cut and fill, especially in broad level terraces and floodplains of the Chattahoochee. Subgrade conditions, poor to good. Large stream crossings require bridges with cut and fill in approaches. Terraces and floodplain of Chattahoochee afford best airfield sites within Fort Benning reservation. Most areas subject to flooding. Plastic clay layers and lenses, commonly interbedded and concealed beneath granular materials that in themselves have adequate bearing capacity. Water table high; many water-saturated clay layers are easily deformed under heavy loads. Foundation investigations essential at all sites to determine maximum permissible loading at required elevation.	Overburden soil thin; absent on sand and gravel bars. Thickness variable; maximum about 6.1 m (20 ft); average less than 3.5 m (10 ft). Underlain by all other units, except Units 2 and 3. Easily excavated by hand tools or power equipment. All layers are loose, unconsolidated; wet clay retards operations by adhesion to equipment. Most excavations below 6.1 m (20 ft) encounter water table, necessitating dragline or other underwater equipment for effective removal. Excavation conditions: Slope stability—Observed slope ratio 1-1/2 to 1. Sliding and slumping—Excavations to 2.44 or 3.05 m (8 or 10 ft), if above water table and in nonclayey materials, are stable. All excavations in clayey materials and below 3.05 m (10 ft) require shoring. Erosion—Easily and rapidly eroded; adequate protective cover or stabilization needed. Drainage—Above water table, drainage is rapid by downward percolation except in clay layers. Seepage rapid in many excavations.	Numerous pits confined to terraces and floodplains of Chattahoochee. Some small pits in sand-gravel bars of streams.
2. High terrace gravelly sand	Gravel-capped isolated hillocks, benches, flat terrace remnants; well-defined marginal scarps along valley axes.	Red clayey gravel and clayey sand, few clay layers. Unconsolidated, well-compacted, ferruginous. Gravel well-rounded milky quartz, quartzite; average maximum size 51 mm (2 in.). Sand contains angular quartz, some feldspar, mica. More uniform, compact, and ferruginous than Unit 1.	Clayey, gravelly sand (Sample Site No. 16)— **Sieve analysis:** Cumulative percent passing[1] 1″ (100); 3/4″ (98); 1/2″ (96); 3/8″ (92); #4 (88); #8 (81); #10 (72); #40 (51); #60 (40); #200 (25). **Silt:** 3% **Clay:** 22%[2] **Liquid limit:** 32 **Plasticity index:** 11 **Volume change:** 3.1% **Specific gravity—** Apparent: 2.63 Bulk (dry): 2.60 Bulk (ssd): 2.61 **Absorption:** 1.3% **Maximum density:** 1810 kg/m³ (113 lb/ft³) **Optimum moisture:** 12% **Soundness 5 ~ Na_2SO_4 loss:** 2.81% **Supplementary data on testing procedures:** Sp gr and absorption on material retained 9.5 mm (3/8 in.). Physical test constants and moisture on material passing #10. Soundness loss is weighted avg for all sizes passing 51 mm (2 in.), retained 9.5 mm (3/8 in.). **Remarks:** Composite channel sample from 6.1 m (20 ft) pit face; clay content high. For basal gravel layers underlying pit floor, see Sample 17 similar material from adjacent pit.	Alinements require shallow to moderately deep cuts and fills for roads with gentle grades and long radius curves. Excavated material suitable for fill, base course, surfacing. Subgrade conditions usually good. Sites for small airstrips extremely limited. Favorable foundation conditions; bearing capacity adequate for temporary structures. Water table low. Heavy design loadings probably require foundation investigation to determine adequate thickness and maximum permissible loading at required elevation.	Overburden sandy clay soil 0.61-1.52 m (2-5 ft). Maximum thickness about 15.24 m (50 ft). Underlain by Units 4, 5, and 8. Excavation possible by hand tools but difficult. Readily removed by power equipment without blasting. More difficult to excavate than Unit 1. Excavation conditions: Slope stability—Observed slope ratio 1/2 to 1; nearly vertical in shallow excavations. Sliding and slumping—Stability high for excavations not exceeding 6.1-7.62 m (20-25 ft); shoring not usually required. Erosion—Not rapidly eroded. Drainage—Drainage slow; runoff rapid. Seepage at contact with sandy clay soil overburden rapid during wet seasons.	Many small, abandoned pits, usually near residential areas; used locally for base course, surfacing, fill.
3. Fine surface sand	Small sand dune area near Chattahoochee River. Small area of low dunes in northeast.	Buff, cream, or light gray sand; very loose, fine-grained. Clay content very low; does not pack well. Composed chiefly of quartz, feldspar, some mica. Contains no gravel.	Dune sand (Sample Site No. 15)— **Sieve analysis:** Cumulative percent passing[1] #10 (100); #40 (54); #80 (3); #200 (1). **Silt:** Trace **Clay:** Trace[2] **Specific gravity—** Apparent: 2.57 Bulk (dry): 2.52 Bulk (ssd): 2.54 **Absorption:** 0.77% **Compressive strength seven days:** Standard (average): 191.57 kg/cm² (2725 lb/in.²) Sample (average): 187.42 kg/cm² (2666 lb/in.²) Strength ratio: 98% **Supplementary data on testing procedures:** Tests on unwashed material retained #200. **Remarks:** Composite channel sample from surface to 3.96 m (12 ft) depth in road-cut exposure.	Limited in extent. Alinements require negligible cut and fill. Subgrade conditions good, well-drained. Stabilization required to prevent wind erosion. Ditches require protective riprap or lining. Airfield sites limited to northeast part of reservation. Good for temporary construction. Excavations require shoring to prevent caving; protection required against erosion, undermining. Where thin layers prevail, stripping will permit footings for heavy design loadings to penetrate foundation materials of underlying units.	Overburden negligible. Unit all sand. Maximum thickness about 6.25 m (20-1/2 ft). Underlain by Units 1, 4, 5, and 6. Easily excavated by hand tools or power equipment. Excavation conditions: Slope stability—Observed slope ratio between 1 to 1 and 2 to 1. Sliding and slumping—Slumping very common in oversteepened slopes. Erosion—Rapidly and easily eroded, except locally case-hardened areas in northeast. Drainage—Rapid drainage by downward percolation. Seepage rapid.	Numerous sites easily developed. One in southwest.

E. ENGINEERING GEOLOGY (Continued)

MAP UNIT	TOPOGRAPHY	ROCK DESCRIPTION	PHYSICAL CONSTANTS* (SELECTED SAMPLES)	ENGINEERING EVALUATIONS**	EXCAVATION FACTORS**	PITS AND QUARRIES
4. Layered mixtures of gravel, sand, and clay	Hillocks with gently undulating summit areas and long interstream ridge crests trending generally north-south.	Flat-lying layers and lenses of poor to well-compacted clay, silt, sand, and gravel mixtures. Layer thickness ranges from few inches to several feet; uniform material in layers over 2.13 m (7 ft) thick uncommon. All layers not laterally continuous or uniform in gradation over very great distance. Gravel chiefly well-rounded milky quartz, quartzite; sand chiefly quartz, feldspar, mica. In places thin seams, bed and concretion-like masses of ironstone; outcrops of thick-bedded, firm, sandy ironstone occur sparingly. Coverage very extensive; represents Tuscaloosa and Eutaw Formations.	Uniformity of components is highly variable from place to place, although this is the most expansive of any of the eight major types of potential building materials. Data on two selected samples are provided herewith although probably not typical over large areas. Clayey sand (Sample Site No. 2)— **Sieve analysis:** Cumulative percent passing[1] #10 (97); #40 (55); #60 (42); #200 (26). **Silt:** 5% **Clay:** 21%[2] **Liquid limit:** 32 **Plasticity index:** 10 **Volume change:** 2.2% **Maximum density:** 1874.11 kg/m³ (117 lb/ft³) **Optimum moisture:** 11% **Supplementary data on testing procedures:** Tests on unwashed material. **Remarks:** Composite channel sample from 4.27 m (14 ft) pit face; excludes 0.91 m (3 ft) overburden soil. Silty sand (Sample Site No. 11)— **Sieve analysis:** Cumulative percent passing[1] #10 (100); #40 (71); #60 (52); #200 (21). **Silt:** 5% **Clay:** 16%[2] **Liquid limit:** 17 **Volume change:** 4.9% **Maximum density:** 1954.20 kg/m³ (122 lb/ft³) **Optimum moisture:** 10% **Supplementary data on testing procedure:** Tests on unwashed material. **Remarks:** Composite channel sample from pit face; surface to 3.96 m (12 ft).	Alinements require moderate to fairly deep cuts and fills, and bridges over most stream crossings. Subgrade conditions usually good except in clay areas. Excavated material suitable for fill, base course, surfacing, binder, aggregate. Airfield sites probably limited topographically to northeast part of reservation or major stream valleys; possibly few summit areas. Good for temporary construction. In north, footings may penetrate crystalline rock of Unit 8. Subsurface investigation essential for heavy design loadings to determine maximum permissible loadings at required elevations.	Overburden sandy or sandy clay soil 0.61-2.13 m (2-7 ft). Maximum thickness about 182.88 m (600 ft). Underlain by Unit 8. Easily excavated by hand tools or power equipment, except limited amount ironstone requires blasting. Excavation conditions: Slope stability—Observed slope ratio between 1-1/2 to 1 and 1 to 1, for depths not exceeding 9.14-12.19 m (30-40 ft). Sliding and slumping—Stability usually high for excavations not exceeding 9.14-12.19 m (30-40 ft) when slopes not oversteepened; shoring required only locally in loose or poorly compacted layers. Erosion—Not rapidly eroded except gentle slopes in poorly compacted material. Minor erosion locally where soil layer is case-hardened. Drainage—Drainage usually rapid; slow in clay areas. Seepage rapid and common at contact with sandy clay soil overburden and above clay layers during wet season.	Numerous pits; extensive exploitation for base course, surfacing, fill. New sites easily developed.
5. Layered micaceous clay and sand	West part of area, undulating with scattered hillocks; long, smooth slopes; rounded hillock summits of limited extent. Exposure belt in east narrower; slopes generally steeper, relief greater.	Flat-lying layers and lenses of well-compacted micaceous clay and sandy clay, poorly compacted clayey sand, and some sand; very little gravel. Layer thickness ranges from a few inches to many feet; not continuous laterally or uniform in gradation for any great distance. Mica content usually high; some layers contain concretions, fossils, gypsum. Unit represents Blufftown Formation.	Silty sand (Sample Site No. 19)— **Sieve analysis:** Cumulative percent passing[1] #10 (100); #40 (64); #60 (52); #200 (17). **Silt:** 1% **Clay:** 16%[2] **Liquid limit:** 48 **Plasticity index:** 17 **Volume change:** 13.7% **Maximum density:** 1457.64 kg/m³ (91 lb/ft³) **Optimum moisture:** 23% **Supplementary data on testing procedures:** Tests on unwashed material. **Remarks:** Composite channel sample of 10.67 m (35 ft) exposure in road cut.	Alinements require moderate to fairly deep cuts and fills, some bridges. Subgrade conditions poor; low bearing capacity, poor drainage; small ponds numerous. Many areas underlain by plastic clay. No favorable airfield sites. Poor for foundations; clayey materials in wet state very unstable; bearing capacity low. Water table high; drainage slow. Foundation investigation imperative for all structures to determine maximum permissible loadings at required elevation.	Overburden soil usually clayey, ranges from few inches to 1.22 m (4 ft). Maximum thickness about 45.72 m (150 ft). Underlain by Unit 4. Easily excavated by hand tools or power equipment. Wet clay retards operations by strong adhesion to equipment. Excavation conditions: Slope stability—Observed slope ratio between 2 to 1 and 3 to 1. Sliding and slumping—Very unstable; clayey materials slide and flow when wet. Vertical walls require shoring. Landslides common. Erosion—Sandy micaceous layers erode easily; clay layers, slowly. Stabilization, riprap, or other protection required. Drainage—Drainage very slow. Much seepage at contact with clayey soil overburden or other permeable layers.	No development. No sites recommended.
6. Micaceous fine sand	Low rolling hillocks with steep-walled flat-floored valleys, small rounded summit areas, elongate ridges. Much rough gullied land.	Fine-grained, loose to poorly compacted buff, tan, yellow, or red sand. Contains up to 20% clay. Composed chiefly of angular quartz, feldspars, mica content high; minor pea gravel; almost no coarse gravel. Thin clay seams present, not prominent. Bedding and layering are distinct. Usually nonplastic. Coverage restricted to southeast; represents Cusseta Sand.	Silty sand (Sample Site No. 21)— **Sieve analysis:** Cumulative percent passing[1] #10 (98); #40 (47); #60 (25); #200 (11). **Silt:** 1% **Clay:** 10%[2] **Maximum density:** 1842.07 kg/m³ (115 lb/ft³) **Optimum moisture:** 12% **Supplementary data on testing procedures:** Tests on unwashed material. **Remarks:** Composite channel sample from pit face; surface to 5.49 m (18 ft). Silty, clayey sand (Sample Site No. 22)— **Sieve analysis:** Cumulative percent passing[1] #10 (100); #40 (75); #60 (50); #200 (21). **Silt:** 6% **Clay:** 15%[2] **Liquid limit:** 20 **Plasticity index:** 4 **Volume change:** 1.5% **Maximum density:** 1906.14 kg/m³ (119 lb/ft³) **Optimum moisture:** 9% **Supplementary data on testing procedures:** Tests on unwashed material. **Remarks:** Composite channel sample of 3.96 m (12 ft) layer in pit face.	Alinements require moderate to deep cuts and fill, bridges over most stream crossings. Cut and fill slopes require stabilization or other protection against erosion. Shoulders and embankments require protective riprap. Subgrade conditions good. Excavated material useful for fill, surfacing, base course. No favorable airfield sites. Good for temporary construction; bearing capacity adequate provided material is confined; protection required against erosion or undermining of footings. Near contact with underlying Unit 5, subsurface investigation essential for heavy design loadings to determine maximum permissible loadings at required elevation.	Overburden soil usually sandy, seldom exceeds 2.13 m (7 ft). Maximum thickness about 60.96 m (200 ft). Underlain by Unit 5. Easily excavated by hand tools or power equipment. Excavation conditions: Slope stability—Observed slope ratio between 1/2 to 1 and nearly vertical for depths not exceeding 7.62 m (25 ft). Sliding and slumping—Stable for excavations not exceeding 7.62 m (25 ft); adequate protection required against erosion or undermining. Erosion—Easily and extensively eroded. Gullies and ravines form rapidly. Protective riprap or stabilization of slopes required. Drainage—Drainage usually rapid by downward percolation. Seepage rapid at contact with clay layers and underlying Unit 5; ponds and springs common.	Numerous pits; exploitation for road construction and maintenance. New sites easily developed.
7. Fine sandy clay	Hillock tops; ridge crests; small, closely spaced, steep-walled valleys; limited summit areas. Rugged terrain with much rough gullied land.	Fine-grained, plastic, poorly bedded and compacted sandy clay, some clayey sand. Partly micaceous with thin sandstone seams, thick clay layers; no gravel; in places highly fossiliferous. Sand grains chiefly quartz, feldspar, some mica. Coverage restricted to extreme southeast part; represents Ripley Formation.	Lean clay or sandy clay (Sample Site No. 23)— **Sieve analysis:** Cumulative percent passing[1] #10 (100); #40 (99); #60 (97); #200 (47). **Silt:** 6% **Clay:** 41%[2] **Liquid limit:** 42 **Plasticity index:** 22 **Volume change:** 7.5% **Maximum density:** 1729.94 kg/m³ (108 lb/ft³) **Optimum moisture:** 15% **Supplementary data on testing procedures:** Tests on unwashed material. **Remarks:** Composite channel sample from road cut; surface to 4.88 m (16 ft).	Alinements require moderate to deep cuts and fills, possibly bridges. Difficult alinements, short-radius curves. Cut slopes require protection against erosion. Subgrade conditions poor; drainage poor. Gutters and ditches require riprap. No favorable airfield sites. Poor for foundations; clayey materials unstable in wet state; bearing capacity low. Heavy design loadings require subsurface investigation to determine maximum permissible loading at required elevation. Protection required against erosion or undermining of footings.	Gray to reddish-brown sandy clay or sand overburden about 0.61-1.22 m (2-4 ft). Maximum thickness about 51.82 m (170 ft). Underlain by Unit 6. Easily excavated by hand tools or power equipment except occasional surface sandy clay layers in dry state. Excavation conditions: Slope stability—Observed slope ratio between 2-1/2 to 1 and 3 to 1. Sliding and slumping—Contains unstable layers that slide or slump on oversteepened slopes; clayey layers flow when wet. Shoring required in most places. Erosion—Easily and rapidly eroded. Stabilization, riprap, or other protection required. Drainage—Drainage is very slow.	No development. No sites recommended.

E. ENGINEERING GEOLOGY (Continued)

MAP UNIT	TOPOGRAPHY	ROCK DESCRIPTION	PHYSICAL CONSTANTS* (SELECTED SAMPLES)	ENGINEERING EVALUATIONS**	EXCAVATION FACTORS**	PITS AND QUARRIES
8. Decomposed crystalline rock	Valley bottoms and lower parts of hillock slopes in north part of area. Rocky outcrops uncommon.	Decomposed granitic rocks, gneiss, schist, commonly cut by quartz veins. Usually unconsolidated granular material containing partially decomposed rock particles, angular quartz fragments with much fine sand, clay, mica. Outcrops of firm, hard bedrock limited, sporadic. Irregular masses or zones of partially weathered rock occur locally at depths of 3.05-9.14 m (10-30 ft). Firm, massive bedrock probably underlies weathered zone at depth of 15.24 m (50 ft) or more.	Fresh granite-like rock (Sample Site No. 1), pit 1/2 mile north of reservation boundary near right bank of Randall Creek— **Specific gravity—** Apparent: 2.76 Bulk (dry): 2.70 Bulk (ssd): 2.72 **Absorption:** 0.7% **Soundness 5 ~ Na_2SO_4 loss:** 0.64% **Los Angeles abrasion test, 500 revolutions:** 39% loss **Supplementary data on testing procedures:** Tests on laboratory-crushed samples. Soundness loss is weighted avg for all sizes tested passing 63 mm (2-1/2 in.), retained 9.5 mm (3/8 in.). **Remarks:** Large, loose blocks of fresh rock from quarry floor.	Alinements require shallow to moderately deep cuts and fills; bridges across streams. Cut slopes in decomposed rock require protection against erosion. Subgrade conditions fair to poor; drainage poor. No favorable airfield sites. Variable for foundations; good in limited areas of fresh to partially weathered rock; fair to poor in weathered, decomposed material. Bearing capacity variable but adequate for temporary construction; inadequate for heavy design loadings. Subsurface investigation essential for all structures to determine maximum permissible loadings at required elevation except where firm bedrock exposures occur.	Sandy clay soil overburden about 0.61-1.52 m (2-5 ft). Weathered zone probably extends to depth of 15.24 m (50 ft). Underlain by firm bedrock; represents crystalline basement rock of region. Excavation conditions are unpredictable. Hard fresh rock zones require drilling and blasting. Upper 9.14 m (30 ft), usually decomposed, can be easily excavated by hand tools or power equipment, except irregular masses of partially weathered rock. Excavation conditions: Slope stability—Observed slope ratio in decomposed material between 1/2 to 1 and 1 to 1 for depths not exceeding 6.1 m (20 ft). No cuts observed in fresh rock. Sliding and slumping—In weathered zone, slumping of rock masses by undermining is common; shoring required for vertical walls. Erosion—Weathered materials easily and rapidly eroded; adequate protection required. Fresh rock unaffected. Drainage—Drainage is slow in most of weathered zone. Seepage at contact with overlying Unit 4, and with large masses of firm rock.	Limited development. Small pits exploited locally for granular materials. Negligible recovery of quarry rock; weathering and overburden usually prohibitive. New quarry sites scarce, require detailed field exploration.

* Data presented in "Physical Constants" column are for one selected representative site; data presented in other columns are generalized, covering a broad range of conditions. For greater detail for other sites, see reference—"Table 3. Engineering Test Data," in EIS 211, **Terrain Study of Fort Benning and Vicinity,** prepared under direction of the Corps of Engineers, by Military Geology Branch, US Geological Survey, Washington, DC, June 1958.

** The groundwater table has wide seasonal fluctuation; lowest on narrow ridges, highest in valley bottoms. Excavations may encounter small, perched water tables above impermeable lenses. Groundwater table may be low in areas where springs or seepage permit leakage from permeable beds.

[1] 100% passing 51 mm (2 in.).

[2] Material in suspension after 8 min (Georgia State Highway Dept. method).

[3] T = trace.

TABLE 2. ENGINEERING USE OF CONSOLIDATED AND UNCONSOLIDATED MATERIALS

ENGINEERING GEOLOGY UNIT	SUITABILITY* COARSE AGGREGATE FOR PCC	FINE AGGREGATE FOR PCC	BASE COURSE	SURFACING	SUBGRADE	EMBANKMENT AND FILL	RIPRAP SAND	MORTAR SAND	ASPHALT SAND	LIGHT RIPRAP AND RUBBLE MASONRY	CUT-STONE MASONRY	OTHER (HEAVY RIPRAP, BINDER CERAMIC)	TOTAL OF SUITABILITY EVALUATIONS
1. Alluvium	Very good[1,3]**	Good to fair[1]	Good[2,3]	Good[1,3]	Good to poor[2]	Good to poor[2]	Fair[1]	Fair[1]	Good[1]			Clay used in ceramic industry	
	(4)	(2.5)	(3)	(3)	(2)	(2)	(2)	(2)	(3)	--	--	(2.5)	(26)
2. High terrace gravelly sand	Good to fair[4]	Good to fair[4]	Very good[5]	Good[5]	Good	Very good[5]	Fair[4]	Fair[4]	Good to fair[4]				
	(2.5)	(2.5)	(4)	(3)	(3)	(4)	(2)	(2)	(2.5)	--	--	--	(25.5)
3. Fine surface sand		Good[6]	Good to fair[7,8]	Good	Good[7]	Good[8]	Good	Good	Good				
	--	(3)	(2.5)	(3)	(3)	(3)	(3)	(3)	(3)	--	--	--	(23.5)
4. Layered mixtures of gravel, sand and clay	Good to fair[9,10]	Good to fair[1,10]	Good[11]	Good[9,11]	Good	Good[11]	Good to fair[9,10]	Good to fair[9,10]	Good to fair[9,10]	Good to poor[12]	Good to poor[12]		
	(2.5)	(2.5)	(3)	(3)	(3)	(3)	(2.5)	(2.5)	(2.5)	(2)	(2)	--	(28.5)
5. Layered micaceous clay and sand		Unsatisfactory[13]	Poor to unsatisfactory	Unsatisfactory	Poor[14]	Poor[14]	Poor[13]	Poor[13]	Poor[13]				
	--	(0)	(0.5)	(0)	(1)	(1)	(1)	(1)	(1)	--	--	--	(5.5)
6. Micaceous fine sand		Fair to poor[15]	Good to poor[16,17]	Good to fair[16]	Good[17]	Good[17]	Fair to poor[15]	Fair to poor[15]	Fair to poor[15]				
	--	(1.5)	(2)	(2.5)	(3)	(3)	(1.5)	(1.5)	(1.5)	--	--	--	(16.5)
7. Fine sandy clay		Poor to unsatisfactory[18,19]	Unsatisfactory	Unsatisfactory	Fair to poor	Fair to poor	Unsatisfactory[19]	Unsatisfactory[19]	Unsatisfactory[19]				
	--	(0.5)	(0)	(0)	(1.5)	(1.5)	(0)	(0)	(0)	--	--	--	(3.5)
8. Decomposed crystalline rocks	Very good[20]	Unsatisfactory[21]	Poor to unsatisfactory[21]	Poor to unsatisfactory[21]	Fair to poor[21]	Fair to poor[21]	Unsatisfactory[21]	Unsatisfactory[21]	Unsatisfactory[21]	Very good[20]	Very good[20]		
	(4)	(0)	(0.5)	(0.5)	(1.5)	(1.5)	(0)	(0)	(4)	(4)	(4)	--	(16)

* Values are for guidance and apply only to the dominant material in the unit, except where indicated otherwise.

Suitability is designated on the relative descriptive scale and respective numerical evaluations of: very good (4), good (3), fair (2), poor (1), unsatisfactory (0), and not applicable (--).

Empirical evaluation by Allen H. Nicol, geologist, Military Geology Branch, US Geological Survey, for Office, Chief of Engineers, US Army.

Numerical evaluations: Terrain Analysis Center, Engineer Topographic Laboratories, Fort Belvoir, VA. (1976).

**CLASSIFICATIONS OF MATERIAL ARE THOSE INDICATED IN THE GEORGIA STATE HIGHWAY DEPARTMENT SPECIFICATIONS

[1] Material may require washing, screening, or other processing.
[2] May require binder for maximum stability.
[3] Not everywhere available within unit.
[4] Requires washing and screening to remove clay; recovery difficult, impracticable.
[5] Applicable to average material; careful moisture control usually required during compaction because characteristics vary with changes in composition and gradation.
[6] Too fine-grained for PCC; requires blending with coarse material.
[7] For well-distributed loadings.
[8] Requires binder for stability unless confined.
[9] Not everywhere available within unit.
[10] Requires processing; recovery often impracticable.
[11] Careful moisture control required during compaction.
[12] Applicable only to limited amount of sandy ironstone rock in the unit.
[13] Clay and mica content usually excessive; processing impracticable.
[14] Compaction very difficult; some layers have elastic rebound.
[15] Requires washing and screening to remove mica and clay; recovery difficult; impracticable. Testing required.
[16] Used for secondary roads.
[17] Drains well but may require binder or confinement for stability.
[18] Gradation is too fine; requires blending with coarse material.
[19] Requires washing, screening for clay removal; recovery difficult, impracticable.
[20] Applicable only to limited amount of unweathered rock in unit; requires quarrying, dressing, or crushing to proper size.
[21] Applicable to weathered zone in most of the unit.

F. SPECIAL PHYSICAL PHENOMENA

A small area of low sand dunes occurs in the northeast and a very much smaller area is in the southwest. Since most parts of these dunes are fairly well stabilized by vegetation, these pose no present problem. These dune areas correspond to Map Unit 3 on the Engineering Geology Map, which may be consulted for distribution and extent.

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

ENGINEERING GEOLOGY

1. Alluvium
2. High terrace gravelly sand
3. Fine surface sand
4. Layered mixtures of gravel, sand, and clay
5. Layered micaceous clay and sand
6. Micaceous fine sand
7. Fine sandy clay
8. Decomposed crystalline rock

Numbers refer to entries in Table 1

CONSTRUCTION MATERIALS

- Borrow pit; letter identifies material*
- Borrow pit; status and material undetermined; probable material indicated
- Rock quarry
- Possible pit or quarry development site
- Pit or processing plant stockpile
- Road cut exposure; principal material indicated
- Known gravel deposit or exposure
- Known sand deposit or exposure
- 2-23 sample site number; see Table 1

*TYPE OF MATERIAL

C–Clay, Clayey**
G–Gravel, Gravelly**
S–Sand, Sandy**
Slt–Silt, Silty**
SS–Sandstone
IS–Ironstone

** May be indeterminate mixtures; however, readily separable mixtures are shown in hyphenated form.

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

1:50,000 SHEET INDEX

3949 II | ELLERSLIE 4049 III | TALBOTTON 4049 II
SEALE 3948 I | COLUMBUS 4048 IV | BUENA VISTA 4048 I
3948 II | LUMPKIN 4048 III | 4048 II

Scale 1:50,000

1 0 1 2 3 Statute Miles
1000 500 0 1000 2000 3000 4000 Meters
1000 500 0 1000 2000 3000 4000 Yards
1 0 1 2 3 Nautical Miles

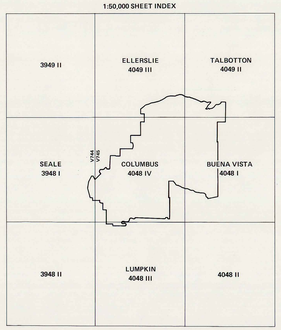
CONTOUR INTERVAL 20 FEET

G. VEGETATION

Vegetation interpretations were made from 1:20,000 scale color aerial photography dated March 1973 and supplemented by various topographic and planimetric maps, textual material, and field notes dated 1967-1976. Areas on the base that were cleared since March 1973 are not shown on the vegetation map. The vegetation pattern for the base changes frequently due to continued tree harvesting and land clearing for various military purposes. Open areas where no vegetation is depicted are built-up areas or areas lacking significant vegetation.

MAP UNIT	DESCRIPTION	DISTRIBUTION	REMARKS	CONCEALMENT	COVER
1	Coniferous trees, largely loblolly and longleaf pine with some shortleaf and slash pine; trunks generally less than 18 cm in diameter; 10-50% crown cover density; trees widely to moderately spaced; branches on the young trees to ground level and on the scattered mature trees to within 15 m from ground level; sparse undergrowth of grass and brush less than 1 m high; numerous small, clear areas; usually plantation-type plantings in rows or along contours; 75% or more of each stand composed of coniferous species.	Stands widely scattered over the base but most frequently found in the eastern half of the post on higher slopes.	Many of the stands regrowth areas of previous logging operations, particularly clear-cutting methods.	Concealment from aerial observation is largely poor to fair year-round for foot troops and vehicles; concealment from ground observation is generally fair year-round for foot troops and poor for vehicles.	Cover from flat trajectory fire of small arms is generally poor for foot troops.
2	Coniferous trees, largely loblolly and longleaf pine with some shortleaf and slash pine; about 25 m average height; trunks 15-50 cm in diameter; 50-100% crown cover density; trunks generally spaced 2 to 5 m apart; branches to ground level on younger, less crowded trees; branches to within 15 m from ground level in mature, dense stands; some widely scattered open areas of grass and brush less than 1 m in height; 75% or more of each stand composed of coniferous species.	Stands located throughout the post, usually on upper slopes and cover approximately 25-30% of the reservation.	Mature trees harvested on an annual basis, usually by clear-cutting methods and, in some cases, by selective cutting. Controlled burning carried out to remove brush accumulations for fire prevention.	Concealment from aerial and ground observation is largely fair to good year-round for foot troops and vehicles.	Cover from flat trajectory fire of small arms for foot troops is good in dense stands and fair in more widely spaced stands.
3	Deciduous trees, principally bottomland species such as water, laurel, and swamp oak, sweetgum and blackgum; trunks generally less than 15 cm in diameter; 10-50% crown cover density; trees widely to moderately spaced; branches on the younger trees to within 1 m from ground level and on older trees to within 3-5 m from ground level; sparse undergrowth of grass and brush less than 1 m high; numerous small openings with some scrub oak in the eastern half of the base; 75% or more of each stand covered by one or more deciduous species.	Stands widely scattered mainly in the northern portion of the post in lowland areas; several old orchards found southeast of Lae Field in Alabama.	Most of the stands regrowth areas of previous logging operations, particularly clear-cutting methods.	Concealment from aerial and ground observation is largely poor for foot troups and vehicles; some concealment available when in leaf April through October.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
4	Deciduous trees, principally bottomland species such as water, laurel, and swamp oak, sweetgum and blackgum; about 20 m average height; trunks 5-15 cm in diameter; 50-100% crown cover density; trunks generally spaced 2-5 m apart; branches to ground level; old trees bordering the Chattahoochee River 15-25 m in height; leafless period generally November through April; 75% or more of each stand covered by one or more deciduous species.	Stands throughout the post in lowlands or on lower slopes; stands in the west and northwest in wider floodplains of the Chattahoochee River and the major creeks; stands elsewhere line the narrower, younger stream valleys.	Some selective cutting of mature trees.	Concealment from aerial and ground observation is largely good from April through October for foot troops and vehicles when trees in leaf; and largely poor the rest of the year.	Cover from flat trajectory fire of small arms for foot troops is fair to good in dense stands and poor to fair elsewhere.
5	Mixture of coniferous and deciduous trees, mainly loblolly and longleaf pine, some shortleaf and slash pine, hickory, red oak, black oak, and white oak; trunks generally less than 18 cm in diameter; 10-50% crown cover density; trees widely to moderately spaced; branches on younger trees to ground level and on older trees 3-15 m from ground level; sparse undergrowth of grass and brush less than 1 m high; some patches of scrub oak less than 4.5 m high; each stand contains roughly equal distributions of coniferous and deciduous species.	Stands widely scattered over the reservation usually on upper slopes.	Stands regrowth areas largely in previously logged areas.	Concealment from aerial and ground observation is poor to fair year-round for foot troops and vehicles.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
6	Mixture of coniferous and deciduous trees, mainly loblolly and longleaf pine, some shortleaf and slash pine, hickory, red oak, black oak, white oak; "wooded swamp" areas along smaller streams commonly include tupelo, blackgum, and sweetbay trees; about 20-25 m average height; trunks 5-50 cm in diameter; 50-100% crown cover density; trunks spaced 2-5 m apart; branches generally to ground level on younger, less crowded trees; branches to within 5-15 m from ground level on mature dense stands; some scattered open cultivated areas, grass, or brush; each stand contains roughly equal distributions of coniferous and deciduous species.	Stands found throughout the reservation on lowlands, side slopes, and upper slopes, but most common northeast of Ochillee Creek; cover approximately 30-35% of reservation.	Mature trees harvested on an annual basis either by clear-cutting or selective cutting methods; controlled burning carried out to remove brush accumulations for fire prevention.	Concealment from aerial and ground observation is fair to good from April through October for foot troops and vehicles, poor to fair the rest of the year.	Cover from flat trajectory fire of small arms for foot troops is good in dense stands and fair in more widely spaced stands.
7	Scrub oak trees; less than 4.5 m high; trunks up to 13 cm in diameter; 10-50% crown cover density; trees widely spaced; branches to ground level; generally sparse undergrowth of grass less than 1 m high; leafless period generally November through March; 75% or more of each stand composed of scrub oak trees.	Stands in the east, and especially the northeast, mainly on higher slopes.		Concealment from aerial and ground observation is generally poor year-round for foot troops and vehicles.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
8	Scrub oak trees; less than 4.5 m high; trunks up to 13 cm in diameter; 50-100% crown cover density; trees closely spaced; trunks spaced 2-4 m apart; generally sparse undergrowth of grass less than 1 m high; leafless period generally November through March; 75% or more of each stand composed of scrub oak trees.	Stands in the east, and especially the northeast, mainly on higher slopes.		Concealment from aerial and ground observation for foot troops is fair from April through October and poor rest of year; poor year-round for vehicles.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
9	Scrub oak trees, less than 4.5 m high, with scattered coniferous trees intermixed; trunks up to 13 cm in diameter for scrub oak and up to 18 cm in diameter for coniferous trees; 10-50% crown cover density; trees widely spaced; branches mainly to ground level; generally sparse undergrowth of grass less than 1 m high; leafless period generally November through March for the scrub oak; 75% or more of each stand covered by scrub oak and up to 25% covered by pine species.	Stands in eastern half of reservation on higher slopes.		Concealment from aerial and ground observation is largely poor year-round for foot troops and vehicles.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
10	Scrub oak trees, less than 4.5 m high, with scattered coniferous trees intermixed; trunks up to 13 cm in diameter for scrub oak and up to 18 cm in diameter for coniferous trees; 50-100% crown cover density; trunks spaced 2-4 m apart; sparse undergrowth of grass less than 1 m high; leafless period generally November through March for the scrub oak; 75% or more of each stand composed of scrub oak and up to 25% covered by pine species.	Stands in eastern half of reservation on higher slopes.		Concealment from aerial and ground observation for foot troops is fair from April through October and poor rest of year; poor year-round for vehicles.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
11	Short grasses, less than 1 m high; field crops, generally rye and some corn, planted for conservation and wildlife cover and food; grassland areas outside of the main cantonment area including airfields, drop zones, and range areas; a few grassland areas include small marshes; widely scattered trees, not to exceed 10% of a particular area, found in some grasslands.	Grasslands throughout the reservation usually on higher slopes; several large grassland areas in the Chattahoochee River lowlands in Alabama.	Some grasslands mowed several times a year.	Concealment from aerial and ground observation is poor year-round for foot troops and vehicles.	No cover for foot troops.
12	Swamps of closely spaced predominantly deciduous trees with open water areas in old oxbows, meanders, and smaller streams; largely perennially wet areas; "wooded swamp" areas along smaller streams commonly include tupelo, blackgum, and sweetbay trees; some deciduous trees exceed 15 m in height along the largest streams.	Largest, most numerous swamps are along the Chattahoochee River in Alabama; other swamps along Upatoi Creek and larger streams; some small swamps upstream or downstream from perennial ponds.		Concealment from aerial and ground observation for foot troops and vehicles is fair from April through October and poor rest of year.	Cover from flat trajectory fire of small arms is largely poor for foot troops.
13	Marsh grasses, less than 1 m high in low generally perennial wet areas; growth open to sparse; most marshes small.	Marshes principally in Chattahoochee River lowlands of Alabama; several marshy grass areas on Fryar Field and Lae Field; other small scattered marshes in the western half of the base in Georgia.		Concealment from aerial and ground observation is poor year-round for foot troops and vehicles.	No cover from flat trajectory fire of small arms.

1:50,000 SHEET INDEX



Scale 1:50,000

1 ½ 0 1 2 3 Statute Miles

1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

1 ½ 0 1 2 3 Nautical Miles

CONTOUR INTERVAL 20 FEET

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

VEGETATION

FORESTS

1. Coniferous trees; nearly open to medium spacing
2. Coniferous trees; medium to dense spacing
3. Deciduous trees; nearly open to medium spacing
4. Deciduous trees; medium to dense spacing
5. Mixed coniferous and deciduous trees; nearly open to medium spacing
6. Mixed coniferous and deciduous trees; medium to dense spacing

SCRUB

7. Scrub oak; nearly open to medium spacing
8. Scrub oak; medium to dense spacing
9. Mixed scrub oak and coniferous trees; nearly open to medium spacing
10. Mixed scrub oak and coniferous trees; medium to dense spacing

GRASSLANDS

11. Short grasses (less than 1 meter) and field crop areas

WETLANDS

12. Swamps; wet areas with over 50% in trees
13. Marshes; wet areas with over 50% in grasses

Numbers alongside each symbol refer to map unit numbers in the text

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

H. CLIMATE

The climate at Fort Benning is that of the humid southeastern United States with characteristically long, hot summers and mild winters. The meteorological station on the reservation at Lawson AAF is located at 70.7 m (232 ft) above sea level while the highest point on the post near its southeastern border is 225.6 m (740 ft). Thus, differences in elevation and other aspects of terrain may produce slight variations in temperature and precipitation at different places on the reservation.

The mean daily minimum temperature in the two coldest months, December and January, is 2.8° C (37° F); and the mean daily maximum in the hottest months, July and August, is 32.8° C (91° F). Over a 28-year period of record, the highest temperature recorded at Lawson AAF, Fort Benning, has been 41.7° C (107° F) and the lowest has been -15.6° C (4° F). The nearby Columbus, GA, meteorological station, with a 77-year period of record, has on one occasion recorded a much lower minimum temperature of -19.4° C (-3° F). There are occasions, perhaps once in two or three years, when the temperature may remain below freezing for more than a day.

Scientific doctrine in the area of environmental health makes use of composite temperature stress indices—"wind chill" in the measurement of cold, and Wet Bulb Globe Temperature or WBGT in the case of heat stress. When a cold air temperature is combined with a high wind speed, the result, so far as its impact on the human body is concerned, is equivalent to a much lower temperature where there is no wind movement. In the case of Fort Benning, the wind chill temperature rarely if ever exceeds -30° C (-22° F) during winter, and therefore frostbite from cold exposure offers little hazard to soldiers wearing adequate winter clothing. Summer WBGT readings, on the other hand, frequently reach a figure of 82, the level at which Army regulations (TB Med 175) recommend discontinuance of strenuous training by unacclimatized personnel.

The annual mean temperature at Columbus is 64° F (17.8° C), and yearly variations from this figure are quite small. Between one year and the next, however, there may be a large temperature variation during the winter months. For example, the January monthly mean was 36.2° F (2.3° C) in 1940 but was 60.4° F (15.8° C) in 1950. This large yearly difference is explained by the contrasting effects of continental influence (cold winds sweeping down from Canada) and of maritime influence (predominating southerly winds bringing tropical Gulf air). In the summer, the monthly temperature differences from year to year are rather small, for the hot humid maritime effect is seldom interrupted by drier and cooler continental air.

Rainfall averages about 48 in. (1219 mm) a year at Fort Benning, but the annual variation is large, with a low (at nearby Columbus) of 30.23 in. (768 mm) in 1954 and a high of 73.50 in. (1867 mm) in 1929. The peak rainfall months are March and July, while the driest period is October and November. The greatest monthly rainfall recorded at Lawson AAF over a 29-year period was 13.24 in. (336.3 mm) in July 1971, while at the nearby Columbus, GA, station the record monthly total was 16.29 in. (413.8 mm) in March 1929. Although thunderstorms bring rain on an average of one-third of the summer days, occasional heavy rains in the autumn may be the product of Gulf or Caribbean hurricanes moving inland.

Traces of snowfall occur at Fort Benning nearly every winter, but any accumulation of several inches, remaining on the ground for more than a day, is so rare a phenomenon that only four instances are reported in the 77 years of record at Columbus. Nevertheless, in the heaviest of these snowfalls (9 February 1973), snow averaged 14 in. in depth at the weather station and as much as 24 in. in a few nearby locales.

Winds at Fort Benning are from a prevailing northerly direction from August to March, from the south in April, and westerly from May to July. The 29-year record peak gust is 70 mph (113 kmph).

See the following tables for summary of climatic and ephemerical data.

CLIMATIC SUMMARY

Columbus/Lawson AAF Latitude 32° 21′N Longitude 85° 00′W Elevation 232 ft (70.7 m)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	YEARS OF RECORD
Absolute maximum temperature	(°C)	28.9	28.8	31.7	33.9	37.2	40.6	41.7	40.0	38.3	36.7	30.0	26.7	41.7	28
Absolute maximum temperature	(°F)	84	83	89	93	99	105	107	104	101	98	86	80	107	28
Mean daily maximum temperature	(°C)	15.0	16.7	20.0	25.0	29.4	32.2	32.8	32.8	30.6	26.1	20.0	15.6	25.0	28
Mean daily maximum temperature	(°F)	59	62	68	77	85	90	91	91	87	79	68	60	77	28
Mean daily minimum temperature	(°C)	2.8	4.4	7.2	11.1	16.1	20.0	21.7	21.7	18.9	11.7	5.6	2.8	12.2	28
Mean daily minimum temperature	(°F)	37	40	45	52	61	68	71	71	66	53	42	37	54	28
Absolute minimum temperature	(°C)	-15.6	-11.1	-7.2	-1.7	4.4	8.3	13.9	15.0	6.7	-3.3	-11.1	-13.9	-15.6	28
Absolute minimum temperature	(°F)	4	12	19	29	40	47	57	59	44	26	12	17	4	28
Mean number days with maximum temperature ≥ 90° F (32.2° C)		0.0	0.0	0.0	0.5	8.5	19.0	22.5	24.5	11.6	1.5	0.0	0.0	88.1	12
Mean number days with minimum temperature ≤ 32° F (0.0° C)		9.8	5.8	3.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3	6.2	11.5	37.0	12
Normal heating degree-days (base 65° F/18.3° C) *		571	448	323	89	6	0	0	0	0	81	324	536	2376	29
Normal cooling degree-days (base 65° F/18.3° C) *		10	12	25	77	236	411	484	474	315	93	6	0	2143	29
Mean dew point temperature	(°C)	3.3	4.4	6.7	11.1	15.6	19.4	21.7	21.1	18.3	12.2	6.7	3.9	12.2	29
Mean dew point temperature	(°F)	38	40	44	52	60	67	71	70	65	54	44	39	54	29
Mean percent relative humidity		75	72	68	68	70	71	76	74	74	73	72	74	72	12
Mean monthly precipitation	(mm)	101.6	111.8	139.7	119.4	81.3	104.1	147.3	101.6	86.4	40.6	68.6	116.8	1219.2	28
Mean monthly precipitation	(in.)	4.0	4.4	5.5	4.7	3.2	4.1	5.8	4.0	3.4	1.6	2.7	4.6	48.0	28
Mean number days with precipitation ≥ 0.1 in. (2.54 mm)		5.8	6.8	6.4	5.7	5.6	6.6	9.1	6.2	5.3	2.7	4.2	7.1	71.3	12
Absolute maximum monthly precipitation *	(mm)	349.5	296.7	413.8	296.4	214.6	275.1	410.0	242.3	223.5	211.8	316.2	270.8	1866.9	69
Absolute maximum monthly precipitation *	(in.)	13.76	11.68	16.29	11.67	8.45	10.83	16.14	9.54	8.80	8.34	12.45	10.66	73.50	69
Absolute minimum monthly precipitation *	(mm)	16.5	30.5	21.6	9.4	2.5	21.6	44.2	24.4	0.8	0.00	7.9	10.9	767.8	69
Absolute minimum monthly precipitation *	(in.)	0.65	1.20	0.85	0.37	0.10	0.85	1.74	0.96	0.03	0.00	0.31	0.43	30.23	69
Absolute maximum 24-hr precipitation	(mm)	63.5	55.9	111.8	139.7	78.7	71.1	71.1	114.3	78.7	111.8	96.5	81.3	139.7	28
Absolute maximum 24-hr precipitation	(in.)	2.5	2.2	4.4	5.5	3.1	2.8	2.8	4.5	3.1	4.4	3.8	3.2	5.5	28
Mean number days with thunderstorms		1.2	2.1	3.2	4.8	6.7	8.9	13.0	9.3	2.3	1.1	1.1	0.8	54.5	12
Mean monthly snowfall	(mm)	0.0	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.27	29
Mean monthly snowfall	(in.)	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	29
Mean number days with snowfall ≥ 1.5 in. (38.1 mm)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12
Mean pressure altitude	(m)	7.32	16.76	29.26	37.49	45.72	51.51	39.01	45.72	48.77	35.36	16.76	7.92	31.70	12
Mean pressure altitude	(ft)	24	55	96	123	150	169	128	150	160	116	55	26	104	12
Percent frequency of surface wind speed ≥ 28 knots (32.24 mph or 51.9 kmph)		0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12
Percent frequency of surface wind speed ≥ 17 knots (19.58 mph or 31.5 kmph)		4.1	5.8	7.2	5.0	1.7	0.9	0.5	0.4	0.6	1.1	2.8	3.4	2.8	12
Mean number days with surface wind ≥ 17 knots (19.58 mph or 31.5 kmph) and no precipitation	(at 1900 LST)	0.7	1.5	3.6	1.3	0.7	0.4	0.2	0.2	0.2	0.6	0.3	0.6	10.3	12
	(at 0100 LST)	0.4	0.8	0.6	0.6	0.0	0.1	0.0	1.0	0.0	0.2	0.4	0.7	3.9	12
	(at 0700 LST)	0.3	0.8	0.8	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.6	3.0	12
	(at 1300 LST)	2.7	2.3	4.7	3.2	1.3	0.3	0.3	0.2	0.2	0.7	1.8	2.4	21.1	12
Mean number days with surface wind 4-10 knots (4.61-11.52 mph or 7.4-18.5 kmph) and temperature 33°-89° F (0.6°-31.7° C) and no precipitation	(at 1900 LST)	10.7	11.8	13.4	13.6	12.4	9.6	8.3	8.1	9.9	7.9	8.1	10.2	124.0	12
	(at 0100 LST)	7.5	7.4	10.0	5.8	3.9	2.8	2.3	2.2	4.2	5.0	6.0	6.0	63.1	12
	(at 0700 LST)	6.6	5.9	7.6	4.7	2.0	2.0	1.7	1.2	4.7	4.0	4.7	5.9	51.0	12
	(at 1300 LST)	12.9	11.7	13.1	14.3	14.8	10.6	8.3	9.3	14.0	15.1	11.0	13.0	148.1	12
Extreme wind speed (peak gust)	(kmph)	61	77	98	77	113	103	113	89	82	66	71	64	113	15
Extreme wind speed (peak gust)	(mph)	38	48	61	48	70	64	70	55	51	41	44	40	70	15
Mean number days with an occurrence of visibility ≤ 0.5 mile (0.8 km)		4.8	4.9	2.6	2.8	1.7	1.4	2.3	1.9	2.5	6.1	6.2	4.8	42.0	12
Percent frequency ceiling ≤ 5000 ft (1524 m) or visibility ≤ 5 miles (8.05 km)		39.4	37.3	33.7	24.2	22.4	23.5	26.3	19.6	26.1	30.8	29.2	34.9	29.0	12
Percent frequency ceiling ≤ 1500 ft (457.2 m) or visibility ≤ 3 miles (4.83 km)	(for 0000-0200 LST)	21.1	16.6	15.1	7.1	3.2	4.6	4.8	3.9	10.2	18.2	16.6	19.1	11.7	12
	(for 0300-0500 LST)	29.4	27.3	23.4	15.2	11.4	9.7	16.9	10.9	18.3	29.7	28.1	26.7	20.6	12
	(for 0600-0800 LST)	31.7	34.8	29.5	22.8	19.4	17.2	22.7	21.4	25.4	36.1	33.1	29.1	26.9	12
	(for 0900-1100 LST)	27.0	26.6	19.7	13.1	10.2	8.9	14.2	9.5	15.6	16.9	19.4	22.7	17.0	12
	(for 1200-1400 LST)	16.0	15.1	13.2	5.6	2.6	2.2	3.5	2.2	6.9	8.2	9.2	13.0	8.1	12
	(for 1500-1700 LST)	10.5	9.8	10.5	3.3	1.8	1.9	2.9	1.4	6.5	6.0	5.2	9.3	5.8	12
	(for 1800-2000 LST)	11.9	10.5	8.5	3.2	2.3	1.4	2.4	1.1	6.7	6.6	5.1	10.2	5.8	12
	(for 2100-2300 LST)	12.3	13.0	11.1	4.3	2.2	1.4	2.2	1.7	6.9	7.6	7.7	12.5	6.9	12
Percent frequency ceiling ≤ 300 ft (91.4 m) or visibility ≤ 1 mile (1.61 km)	(for 0000-0200 LST)	5.7	3.1	2.0	0.8	0.6	1.4	0.9	0.5	2.4	5.3	6.1	6.5	2.9	12
	(for 0300-0500 LST)	9.4	7.5	5.7	4.5	3.0	2.0	3.9	3.1	4.4	11.9	12.7	9.3	6.5	12
	(for 0600-0800 LST)	11.7	11.5	8.6	6.0	3.5	2.0	4.4	4.6	6.0	13.7	15.4	9.4	8.1	12
	(for 0900-1100 LST)	5.4	3.3	1.1	0.6	0.2	0.2	0.3	0.1	0.4	0.9	2.2	2.9	1.5	12
	(for 1200-1400 LST)	1.2	0.7	0.5	0.3	0.0	0.2	0.2	0.0	0.3	0.0	0.4	1.1	0.4	12
	(for 1500-1700 LST)	0.8	0.3	0.7	0.0	0.1	0.4	0.7	0.3	0.3	0.1	0.6	0.5	0.4	12
	(for 1800-2000 LST)	0.6	0.5	0.9	0.1	0.4	0.1	0.4	0.3	0.3	0.4	0.6	1.0	0.5	12
	(for 2100-2300 LST)	1.7	1.6	0.7	0.6	0.2	0.0	0.4	0.0	0.5	0.4	2.5	0.3	1.0	12
Mean number days with sky cover ≤ 30 percent and visibility ≥ 3 miles (4.83 km)	(at 1900 LST)	8.2	6.9	8.6	10.8	8.5	6.2	3.0	6.7	8.1	13.6	13.9	11.0	105.5	12
	(at 0100 LST)	13.1	12.0	14.1	17.3	17.5	15.8	15.1	17.1	15.2	18.1	16.1	13.5	184.9	12
	(at 0700 LST)	9.1	9.0	8.8	9.1	9.2	8.3	6.9	9.5	8.5	10.0	12.0	12.0	112.4	12
	(at 1300 LST)	7.8	7.1	8.4	9.8	7.1	5.4	3.9	7.0	6.2	12.6	13.2	9.9	98.4	12
Mean number days with ceiling ≥ 1000 ft (304.8 m) and visibility ≥ 3 miles (4.83 km)	(at 1900 LST)	28.4	26.0	29.4	29.3	30.4	29.5	20.3	30.5	28.8	29.8	29.3	28.8	350.5	12
	(at 0100 LST)	27.0	25.4	27.9	29.0	30.2	29.2	30.1	30.4	28.1	28.1	26.6	26.6	338.6	12
	(at 0700 LST)	23.3	21.1	23.3	23.4	26.0	25.6	24.4	24.4	22.9	20.6	22.1	24.0	281.1	12
	(at 1300 LST)	27.2	25.0	27.9	28.7	30.7	29.7	30.4	30.7	28.9	29.1	27.8	27.7	343.8	12
Mean number days with ceiling ≥ 2000 ft (609.6 m) and visibility ≥ 3 miles (4.83 km) and surface wind ≤ 10 knots (11.5 mph)	(at 1900 LST)	21.1	18.2	17.7	19.7	24.4	24.6	26.3	27.2	26.3	26.2	24.7	23.9	280.3	12
	(at 0100 LST)	21.3	19.8	21.5	25.0	28.6	28.1	29.0	29.7	26.2	25.1	23.6	22.3	300.2	12
	(at 0700 LST)	17.3	15.2	16.8	19.4	23.3	23.6	22.5	22.8	19.8	17.6	17.6	19.3	235.2	12
	(at 1300 LST)	15.2	11.6	12.9	15.8	20.2	21.8	24.8	26.1	20.4	20.4	16.8	17.0	223.0	12
Mean number days with ceiling ≥ 2500 ft (762.0 m) and visibility ≥ 3 miles (4.83 km)	(at 1900 LST)	25.9	23.8	27.4	28.5	29.6	28.7	29.6	29.5	27.6	28.3	27.8	26.0	332.7	12
	(at 0100 LST)	24.1	22.3	24.8	27.8	29.3	28.6	29.6	29.8	26.6	25.9	24.9	24.1	317.8	12
	(at 0700 LST)	19.4	17.2	19.4	20.3	23.4	23.1	22.1	22.7	19.9	17.8	19.3	21.0	245.6	12
	(at 1300 LST)	22.5	20.3	23.9	26.4	27.2	26.4	26.0	27.8	24.8	25.1	24.8	23.4	298.6	12
Mean number days with ceiling ≥ 6000 ft (1828.8 m) and visibility ≥ 3 miles (4.83 km)	(at 1900 LST)	20.5	19.8	23.3	24.1	24.7	23.5	23.7	24.6	25.0	24.4	24.9	22.2	280.7	12
	(at 0100 LST)	19.9	19.2	22.5	25.2	27.6	27.1	28.2	28.3	25.5	24.1	22.4	20.8	290.8	12
	(at 0700 LST)	15.2	14.7	16.6	17.8	21.2	21.5	21.5	22.1	18.8	15.5	17.3	18.4	220.6	12
	(at 1300 LST)	18.7	17.4	19.4	20.5	20.7	17.5	17.2	22.5	18.9	22.1	23.2	20.0	238.1	12
Mean number days with ceiling ≥ 10,000 ft (3048.0 m) and visibility ≥ 3 miles (4.83 km)	(at 1900 LST)	19.5	17.6	22.1	22.9	23.3	22.1	22.6	23.4	22.9	23.4	23.3	20.8	263.9	12
	(at 0100 LST)	18.9	17.7	20.7	24.0	25.7	25.9	27.4	27.2	24.1	22.7	21.4	20.0	275.7	12
	(at 0700 LST)	14.1	13.2	15.4	16.1	20.0	20.5	20.1	21.1	17.1	14.4	16.1	17.5	205.6	12
	(at 1300 LST)	17.6	16.3	18.2	19.5	20.1	17.1	16.5	21.8	18.3	21.5	22.1	17.9	226.9	12

* Data derived from Columbus, GA station records, not from Lawson AAF (Fort Benning).

EPHEMERIS FOR FORT BENNING, GEORGIA
(Eastern Standard Time)

DATE	NAUTICAL TWILIGHT BEGINNING	NAUTICAL TWILIGHT END	SUNRISE	SUNSET
January 1	0644	1831	0742	1746
January 11	0645	1851	0742	1754
January 21	0644	1859	0740	1803
February 1	0639	1908	0734	1813
February 11	0633	1917	0727	1822
February 21	0623	1924	0717	1831
March 1	0615	1930	0708	1837
March 11	0603	1938	0652	1846
March 21	0550	1945	0643	1852
April 1	0535	1953	0629	1900
April 11	0522	2001	0616	1907
April 21	0509	2009	0604	1914
May 1	0457	2018	0554	1921
May 11	0446	2027	0545	1928
May 21	0438	2036	0538	1935
June 1	0432	2044	0534	1942
June 11	0429	2050	0532	1947
June 21	0430	2053	0533	1950
July 1	0433	2054	0536	1951
July 11	0439	2051	0541	1949
July 21	0446	2046	0547	1945
August 1	0455	2037	0554	1938
August 11	0504	2026	0601	1929
August 21	0512	2014	0608	1918
September 1	0520	1959	0615	1905
September 11	0527	1945	0621	1852
September 21	0534	1931	0627	1838
October 1	0541	1918	0634	1825
October 11	0548	1906	0641	1813
October 21	0554	1854	0648	1801
November 1	0603	1844	0657	1750
November 11	0610	1837	0706	1742
November 21	0618	1833	0714	1737
December 1	0626	1832	0723	1735
December 11	0633	1833	0731	1735
December 21	0639	1837	0737	1739

I. CROSS-COUNTRY MOVEMENT

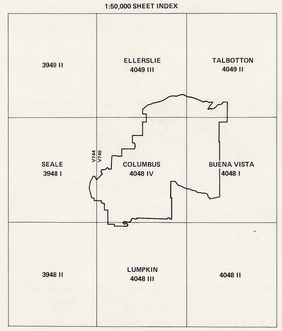
MAP UNIT	GENERALIZED TERRAIN CONDITIONS	MOVEMENT OF TRACKED VEHICLES*	MOVEMENT OF WHEELED VEHICLES**	MOVEMENT OF FOOT TROOPS
1	Dominantly open, cleared areas. Very gently rolling to steeply sloping uplands. Most slopes range between 3 and 15 percent. Areas cleared and primarily used for varied training purposes (maneuver areas, firing ranges, air landing strips, etc.). Soils predominantly sandy except scattered areas in the south where soils having undergone severe erosion are clayey at the surface. Vegetation consists mainly of grasses and other herbaceous growth. Some areas not fully utilized or abandoned contain considerable young pine. Scrubby oaks (black-jack oak, post oak, etc.) thrive on some very sandy ridges in eastern third of reservation.	Generally easy in any direction for both tank and APC when soils dry. Local obstructions easily bypassed. Movement on clayey soil areas somewhat slowed after rains.[1] Scrub oaks a nuisance, but movement only slightly affected. Grass cover reduces dust problems during maneuvers in dry weather.	Fairly easy most of year. Slowed after rains by slippery soil conditions, particularly upslope movement; slipperiness generally of short duration. Upslope movement also somewhat difficult in scrub oak areas, especially where dry, very sandy soils have been loosened and "fluffed" by previous vehicular traffic. Careful driving required in order to maintain traction in deep, loose sand. Movement conditions improved when sand is wet or moist.	Unhindered in most places. Slightly slowed in areas of scraggly scrub oak and in tracts with young pine.
2	Nearly level, mostly cleared and open, floodplains and low terraces. Extensive tracts occur in the Lawson AAF vicinity and the Lae and Fryar Field areas in Alabama portion of the reservation. Slopes less than 3 percent. Soils mostly sandy or loamy. After heavy prolonged rains, soil strength degraded in areas where artificial drainage not provided. Compared with uplands, these lowland soils slow to dry and regain their bearing strength. Vegetative growth mainly grass or low scrub. Some tracts periodically mowed. Constructed ditches of varying depth, drain excess surface water from some flat or depressional areas.	Unrestricted throughout year when soils firm. Drainage ditches can be crossed with little difficulty. Tank movement may be difficult or locally stopped for brief periods after long rainy periods due to soft soils. Soft soil conditions last somewhat longer on loamy soils compared with sandy areas but low strength soil conditions seldom exceed a day or two. APC movement relatively easy.	Moderately hindered by ditches; most can be crossed at selected places. When soils wet and soft, movement conditions are deteriorated. Movement in trace to be avoided if possible; soil strength generally sufficient to support one or two vehicles. Grass sod assists in vehicle traction and weight support.	Easy most of year except somewhat laborious after soaking rains when many soils are rather soft. Areas covered by scrub are more difficult to traverse, compared with grass-covered tracts.
3	Partly wooded, gently to moderately sloping upland plains. Most slopes range between 3 and 8 percent. Soils predominantly sandy and well drained; a few clayey areas in the south. Vegetation mainly coniferous (loblolly, longleaf, and shortleaf pines) with many small, grass- or brush-covered openings. Openings seldom have sharply defined boundaries. Tree spacing and trunk diameters highly varied; most trees about 5.5 to 9.0 m (18 to 30 ft) apart with diameters ranging from 10 to 30 cm (4 to 12 in.) dbh.	Moderately slowed by wooded vegetation; twisting and turning required to avoid large trees. Once a lead vehicle has picked path through vegetation, other vehicles following same trail experience little difficulty. Movement easy in openings. Slippery soil conditions prevail after rains in clayey areas but only for short periods.	Severely slowed by forest vegetation; fairly easy in grass- or brush-covered openings when soils dry. Conditions degraded in clayey soil areas when soils soft or slippery. Visibility moderately impaired in wooded areas.	Slightly to moderately slowed by combined effects of trees and brushy vegetation in some forest openings. Easy in grass-covered openings.
4	Moderately dense forested uplands with few open areas. Terrain similar to Map Unit 3 except trees are closer spaced, openings fewer, and slopes somewhat steeper. Most slopes range between 3 and 15 percent. Coniferous trees randomly spaced; most average about 3.7 to 6.0 m (12 to 20 ft) apart.	Tank movement severely slowed, but not stopped, by randomly spaced trees. APC slowed but not as severely as tank. In clayey areas, movement conditions severely impaired after soaking rains. Movement in trace should be avoided until soils have regained tractive capacity.	Not practical for long distances due to randomly spaced trees too large to push over. Limited movement feasible in openings but only for short distances. Risk of damage to vehicles unacceptably high.	Moderately slowed by combined effects of trees, brushy vegetation in some forest openings, and locally steep slopes.
5	Densely forested uplands. Slopes range from gently sloping to very steep. Steeper slopes occur mainly on sides of narrow valleys and wooded ravines. Most slopes less than 15 percent but locally, slopes much steeper—as much as 60 percent in a few places. Trees dominantly coniferous with some interspersed hardwoods, mainly oaks. Gradations in tree size, spacing, and density of foliage, occur throughout map unit area; overall, growth tends to be thick or dense. Undergrowth fairly dense in localized areas, particularly on lower portions of slopes near drainageways. Typical soil consists of grayish brown, loamy sand surface overlying yellowish red, friable, sandy clay loam subsoil. Minor areas of surficial clayey soils in southern part of reservation. Clayey soils become either slippery, sticky, or soft after rains, depending on rainfall amounts and pattern.	Movement of tanks generally prohibited in most of map unit area due primarily to closely spaced trees and, secondarily, to locally steep slopes. These two factors combine to make tank movement largely impractical. Some maneuvering possible in local areas where vegetation relatively thin. Movement of APC slow but seldom halted when soils dry.	Not practical except locally.	Slow but not difficult. Movement slowed by steep slopes and dense forest undergrowth. Additionally slowed during and after rains by slippery, sticky, or soft ground conditions in clayey soil areas.
6	Nearly level, densely forested floodplains and low stream terraces. Slopes generally less than 3 percent. Vegetation dominated by dense assemblage of hardwood trees and shrubs comprised of several varieties of gums and oaks, sweet bay, red maple, and tupelo; some scattered pine. Undergrowth typically dense; locally, tangled vines and briars. Map unit includes segments of swampy drainageways; many swampy areas direct result of beaver activities. Stumps and fallen trees common. Soils mainly sandy or loamy at surface. Soil bearing strength low in many places, particularly during late winter and early spring, and after soaking rains at other times of year. Soils in swampy areas prevailingly soft and miry throughout year.	Precluded by dense vegetation, stumps, and fallen trees, combined with soft soil conditions along portions of many drainageways. Local movement may be feasible, especially for the M-113 APC. Visibility moderately impaired, particularly when trees and undergrowth in full leaf.	Precluded at all times by dense vegetation and soft soil along portions of many drainageways.	Severely slowed by dense forest undergrowth, fallen trees, and poorly drained soils along portions of many drainageways. Visibility at eye level severely restricted in distance when trees, shrubs, and undergrowth are in full leaf.

[1]Rainy spells that adversely affect the bearing strength of soils occur at any time throughout the year. However, they are most likely to occur between mid-December and mid-April, and again in late summer, usually September.

* Comments apply to the M-60 tank and the M-113 armored personnel carrier (APC).

** Comments apply to the M-35, 2-1/2-ton truck and the M-151, 1/4-ton truck.

1:50,000 SHEET INDEX



Scale 1:50,000

1 ½ 0 1 2 3 Statute Miles

1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

1 ½ 0 1 2 3 Nautical Miles

CONTOUR INTERVAL 20 FEET

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

CROSS-COUNTRY MOVEMENT

NOTE

This map deals with cross-country movement, or movement away from roads, and is primarily intended for use in planning operations. For determining exact movement routes, reconnaisance on the ground is required. Data on terrain factors and evaluations are necessarily generalized to suit the scale of the map and scope of the study. Many areas of minor areal extent, such as tracts of forest, cleared areas, etc., are too small to depict. Recent or continuing alterations to the landscape, such as clearing operations for new or enlarged firing ranges, are not portrayed.

The predicted movement ratings are those believed to prevail during most of the year. Variations in these ratings may occur from year to year and even within a season because of abnormal weather conditions. The ratings will generally be degraded for short periods after heavy rains due to soft miry conditions in clayey soil areas and by swollen streams. These wet spells are most likely to occur between mid-December and mid-April, and again in late summer, usually September. Areas with no color represent "built-up areas" and are not evaluated.

EVALUATION OF TERRAIN FOR CROSS-COUNTRY MOVEMENT

MAP UNIT	TERRAIN UNIT	PREDICTED MOVEMENT RATINGS FOR: TANK (M-60)	APC (M-113)	2½ t. TRUCK (M-35)	¾ t. TRUCK (M-151)	FOOT TROOPS
1	Open, cleared uplands.	Good	Good	Good	Good	Good
2	Open, cleared floodplains and low terraces.	Good	Good	Fair	Fair	Good
3	Thinly wooded, sandy uplands with many open areas. Most slopes moderate.	Fair	Fair	Poor	Poor	Fair
4	Moderately dense wooded uplands with few open areas. Most slopes moderate to steep.	Poor	Fair	Unsuited	Unsuited	Fair
5	Densely wooded uplands.	Unsuited	Poor	Unsuited	Unsuited	Fair
6	Densely wooded floodplains and low terraces containing areas of poorly drained soils or swamps along drainageways.	Unsuited	Unsuited	Unsuited	Unsuited	Poor

EXPLANATION OF RATING TERMS

Good — Conditions permit free movement in any direction. Terrain will permit 12 or more passes in trace of an M-60 tank or permit at least one maneuver (starts, stops, sharp turns, or crossing of tracks) at one location.

Fair — Conditions moderately hinder progress or moderately restrict choices of direction for movement. Terrain will permit 3 to 12 passes in trace of an M-60 but maneuvering will be difficult.

Poor — Conditions severely hinder progress or greatly restrict choice of movement routes. Terrain will probably permit up to 3 passes in trace of an M-60. Very cautious driving required. Movement in trace should be avoided.

Unsuited — Conditions preclude all but local movement. Engineer work required for vehicular movement.

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

J. LINES OF COMMUNICATION

1. ROADS

The road system of Fort Benning is a fairly dense network of Federal and Georgia State hard-surfaced highways, reservation hard-surfaced roads, tank trails, and improved and unimproved dirt roads. Together they provide Fort Benning with over 1380 kilometers (857 miles) of roads. The depicted hard-surfaced roads totaling about 24 km (15 miles) are open at all times to civil and military wheeled vehicles; only Buena Vista Road and a short stretch of Hourglass Road can be used also by tracked vehicles. The depicted dirt roads, totaling about 1140 km (708 miles), are used by both wheeled and tracked vehicles; tank trails comprised only about 40 km (25 miles) of the dirt roads.

Because of their similar characteristics, tank trails, improved dirt roads, and unimproved dirt roads have been treated in the table below in groups rather than given individual treatment.

ROADS

ROUTE NUMBER/ NAME	ROUTE LOCATION (GRID REFERENCE) FROM	TO	LENGTH OF SEGMENT	MILITARY LOAD CLASSIFICATION	ROUTE TYPE	SURFACE CONSTRUCTION MATERIALS	SURFACE WIDTH/CONDITION	SHOULDER CONSTRUCTION MATERIALS	SHOULDER WIDTH/CONDITION	REMARKS
US 27 and 280, GA 1; Victory Drive	938871	076766	18.4 km (11.4 miles)		All weather	Bituminous	16.2 m (53 ft 2 in.) excluding 9.1 m (30 ft) median strip; good	Sod and dirt	2.4 m (8 ft); good	4 lanes, divided.
GA 357 Benning Blvd.	921833	930871	3.9 km (2.4 miles)		All weather	Bituminous	15.2 m (50 ft) excluding 6.4 m - 53.3 m (21 ft - 175 ft) median strip; good	Sod	2.4 m (8 ft); good	4 lanes, divided.
GA 357	001993	001982	1.1 km (0.7 miles)		All weather	Bituminous	7.6 m (25 ft); good	Sod	2.4 m (8 ft); good	
GA 357	001963	002942	2.1 km (1.3 miles)		All weather	Bituminous	7.6 m (25 ft); good	Sod	2.4 m (8 ft); good	
Lindsay Creek Parkway	952832	951867	3.5 km (2.2 miles)		All weather	Bituminous	15.2 m (50 ft) excluding 10.1 m (33 ft) median strip	Bituminous	3 m (10 ft) on northbound lanes; 1.2 m (4 ft) on southbound lanes; good	4 lanes, divided. This road still under construction.
Interstate 185, GA 1, Lindsay Creek Bypass	949878	951867	0.7 km (0.4 miles)		All weather	Bituminous	15.2 m (50 ft) excluding 10.1 m (33 ft) median strip; under construction	Bituminous	3 m (10 ft) on northbound lanes; 1.2 m (4 ft) on southbound lanes; good	4 lanes, divided.
Buena Vista Road	002942	203840	24.8 km (15.4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	Deeded to Federal Government upon completion of State Route 26. Tracked vehicles utilize this road.
GA 26	071771	076772	0.5 km (0.3 miles)		All weather	Bituminous	7.6 m (25 ft); good	Sod	2.4 m (8 ft); good	
GA 137	138770	203800	3.2 km (2 miles)		All weather	Bituminous	7.6 m (25 ft); good	Sod	2.4 m (8 ft); good	
GA 355	202793	204788	0.6 km (0.4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
1st Division Road	922824	040862	14.7 km (9.2 miles)		All weather	Concrete and bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
1st Division Road	920825	922824	0.3 km (0.2 miles)		All weather	Concrete	7.2 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	2 lanes, 1 way.
Sightseeing Road	904811	906797	2.6 km (1.6 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
82nd Airborne Division Road	883776	808891	5.1 km (3.2 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
River Road	884780	957743	8.4 km (5.2 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Dixie Road	903780	941812	6.3 km (3.9 miles)		All weather	Bituminous	7.6 m (25 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
101st Airborne Division Road	865782	933724	9.6 km (6 miles)		All weather	Bituminous	7.6 m (25 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
1st Calvary Division Road	935832	947816	1.9 km (1.2 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Marne Road	921833	992862	8.7 km (5.4 miles)		All weather	Bituminous	6.7 m (22 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Jamestown Road	009837	032727	11.7 km (7.3 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Red Arrow Road	040862	046933	9.5 km (5.9 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Wood Road	026859	028835	2.3 km (1.5 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Goodluck Road	011774	021796	2.3 km (1.4 miles)		All weather	Bituminous	5.8 m (19 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Americal Road	005842	008852	1 km (0.6 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
8th Division Road	993829	049822	6.4 km (4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Ivy Road	977845	984831	1.3 km (0.8 miles)		All weather	Bituminous	6 m (20 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Custer Road	921842	968869	5.1 km (3.2 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Santa Fe Road	942869	956825	5.1 km (3.2 miles)		All weather	Concrete and bituminous	6.7 m (22 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Wildcat Road	006884	012937	8.2 km (5.1 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
2nd Armored Division Road	986883	090921	7.2 km (4.5 miles)		All weather	Bituminous	7.2 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Cusseta Highway	960890	072770	19 km (11.8 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
St. Mary's Road	981897	987895	0.6 km (0.4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Concord Trail	153955	147918	4 km (2.5 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	No lane divisions indicated.
Moye Road	987882	002926	5.5 km (3.4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	
Louvalo Road	066708	079714	1.5 km (0.9 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	1.8 m - 2.4 m (6-8 ft); good	No lane divisions indicated.
Ingersoll St.	914826	921811	1.5 km (0.9 miles)		All weather	Concrete and bituminous	7.3 m (24 ft); good	Sod	1.8 m (6 ft); good	
Sigerfoos Road	920834	824922	0.5 km (0.3 miles)		All weather	Bituminous	9.4 m (31 ft); good	Sod	2.4 m (8 ft); good	2 lanes; 1 way.
Morrison Road	916823	921823	0.9 km (0.6 miles)		All weather	Bituminous	11 m (36 ft); good	Sod	2.4 m (8 ft); good	
10th Armored Division Road	025936	028011	8.2 km (5.1 miles)		All weather	Bituminous and concrete	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Lumpkin Road	921835	922824	1.3 km (0.8 miles)		All weather	Bituminous and concrete	11 m (36 ft); good	Sod	2.4 m (8 ft); good	3 lanes; 1 way.
Lumpkin Road	922824	923812	1.1 km (0.7 miles)		All weather	Concrete and bituminous	9.7 m (32 ft); excluding 7.6 m (25 ft); median strip	Sod	2.4 m (8 ft); good	4 lanes.
Vibert Ave.	903822	921829	1.9 km (1.2 miles)		All weather	Concrete	9.4 m (31 ft); good	Sod	2.4 m (8 ft); good	
Wold Ave.	904820	921825	1.8 km (1.1 miles)		All weather	Concrete	11 m (36 ft); good	Sod	2.4 m (8 ft); good	
Marchant St.	905818	916821	0.89 km (0.5 miles)		All weather	Bituminous	6.7 m (22 ft); good	Sod	2.4 m (8 ft); good	
Edwards St.	908827	915807	2.3 km (1.4 miles)		All weather	Bituminous	9.8 m (32 ft); good	Sod	2.4 m (8 ft); good	
Anderson St.	905818	903824	0.9 km (0.5 miles)		All weather	Concrete and bituminous	9.4 m (31 ft); good	Sod	2.4 m (8 ft); good	
Indian Head Road	893799	905818	3.1 km (1.9 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	There is a short strip of 4 lanes divided road from 899810 to 901812. It is 0.2 km (0.1 mile) long, 14.5 m (43 ft) wide excluding 2.7 m (9 ft) median strip.
Lavoi Ave.	902813	907804	0.6 km (0.4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Bradshaw Road	889798	891808	2.7 km (1.7 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Babbit Road	032818	038827	1.4 km (0.9 miles)		All weather	Concrete and bituminous	5.2 m (17 ft); good	Sod	2.4 m (8 ft); good	
Hourglass Road	018802	071840	5 km (3.1 miles)		All weather	Bituminous and loose surface	7.3 m (24 ft); fair	Sod	2.4 m (8 ft); good	Tracked vehicles use a short stretch of hard-surface section.
10th St.	978870	981872	0.3 km (0.2 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Scott St.	971874	987884	2.3 km (1.4 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Columbus Ave.	960890	969869	1.6 km (1 mile)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Central St.	961884	966870	1.3 km (0.8 miles)		All weather	Bituminous	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
4th St.	971881	971875	0.5 km (0.3 miles)		All weather	Concrete	7.3 m (24 ft); good	Sod	2.4 m (8 ft); good	
Tank Trails			39.1 km (24.3 miles)		All weather (certain sections may become slightly impeded by slippery or muddy conditions after heavy rainstorms)	Sand and clay (some sections stabilized with Number 1 crushed stone)	7.6 m - 10.7 m (25 ft - 35 ft); good			Trails may or may not meet full military specifications.
Improved Dirt Roads			459 km (285.2 miles)		Fair weather (may become slippery and miry after heavy rain, particularly during the winter and spring)	Sand and clay (some sections stabilized either with creek-run sand/gravel, or crushed aggregate)	3.7 m - 12.2 m (12 ft - 40 ft); good to poor			Objective is to grade roads monthly; more frequently if required.
Unimproved Dirt Roads			638.7 km (396.9 miles)		Fair weather (may become slippery and miry after heavy rain, particularly during the winter and spring)	Sand and clay	3.7 m - 7.3 m (12 ft - 24 ft); good to poor			Will not withstand day to day use.

I. ROADS (Continued)

ROAD BRIDGES

BRIDGE NO./NAME	ROUTE DESIGNATION	GRID REFERENCE	FEATURE CROSSED	MILITARY LOAD CLASSIFICATION* W	T	DIMENSIONS	CLEARANCE	TYPE/CONSTRUCTION MATERIALS	CONDITION	REMARKS
1 (M9382); Betjeman Bridge	Lumpkin Road (Southbound)	921835	Upatoi Creek	(2) 40 (1) 40	40 40	97.8 m (321 ft) long; 17.7 m (58 ft) wide; roadway width 7.9 m (26 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
2 (M9385)	Lumpkin Road (Northbound)	922835	Upatoi Creek	(2) 40 (1) 40	40 40	98.1 m (322 ft) long; 12.2 m (40 ft) wide; roadway width 7.9 m (26 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
3 (M9386)	Santa Fe Road	944843	Upatoi Creek							Bridge removed in November 1975.
4 (M9384); Amfreville Bridge	River Road	905773	Laundry Creek	(2) 60 (1) 78	55 80	30.6 m (100 ft 4 in.) long; 8.5 m (28 ft) wide; roadway width 7.4 m (24 ft 2 in.)	Unlimited vertical	Deck; treated timber	Good	
5 (M9381); General Eddy Highway Bridge	82nd Airborne Division Road	883776	Chattahoochee River	(2) 60 (1) 60	60 60	325.1 m (1066 ft 6 in.) long; 11 m (36 ft) wide; roadway width 8.5 m (28 ft)	Unlimited vertical; underbridge vertical 11.3 m (37 ft) during high water	Deck; reinforced concrete	Good	
6 (M9392)	101st Airborne Division Road	905747	Uchee Creek	(2) 55 (1) 70	50 60	43.3 m (142 ft) long; 9.1 m (30 ft) wide; roadway width 7.3 m (23 ft 10 in.)	Unlimited vertical	Deck; reinforced concrete	Good	
7 (M9388)	1st Division Road	029859	Ochillee Creek	(2) 30 (1) 115	30 95	39.6 m (130 ft) long; 6.7 m (22 ft) wide; roadway width 6.1 m (20 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
8 (M9389); McBridges Bridge	Red Arrow Road	050881	Upatoi Creek	(2) 30 (1) 112	30 88	64 m (210 ft) long; 67 m (22 ft) wide; roadway width 6.1 m (20 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
9 (M9390)	2nd Armored Division Road	033887	Wolf Creek	(2) 60 (1) 100	56 70	29.3 m (96 ft) long; 10.4 m (34 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
10 (M9383)	2nd Armored Division Road	066894	Randall Creek	(2) 30 (1) 41	0 34	29.2 m (95 ft 10 in) long; 9.8 m (32 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
11	Lindsay Creek Parkway (Northbound)	947846	Upatoi Creek	(2) 44 (1) 44	44 44	153 m (502 ft) long; 15.2 m (50 ft) wide; roadway width 11.6 m (38 ft)	Unlimited vertical	Deck girder; reinforced concrete	Good	
12	Hourglass Road	109911	Pine Knot Creek	(2) 30 (1) 76	30 58	14.1 m (25 ft 10 in.) long; 6.7 m (22 ft) wide; roadway width 6.4 m (21 ft)	Unlimited vertical	Deck; treated timber	Good	
13	NUMBER NOT USED									
14	Buena Vista Road	076927	Randall Creek	(2) 30 (1) 120	30 80	62.1 m (203 ft 10 in.) long; 7.3 m (24 ft) wide; roadway width 6.1 m (20 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
15	Buena Vista Road	109918	Upatoi Creek	(2) 30 (1) 60	30 40	80.7 m (264 ft 10 in.) long; 6.1 m (20 ft) wide; roadway width 5.8 m (19 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
16	Buena Vista Road	131912	Pine Knot Creek	(2) 5 (1) 6	5 6	61 m (200 ft) long; 7.9 m (26 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
17	Cactus Road	192912	North Fork of Pine Knot Creek	(2) 30 (1) 55	38 50	18.5 m (60 ft 8 in.) long; 7.9 m (26 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical	Deck; treated timber	Good	
18	Massey Road	019942	Wolf Creek	(2) 0 (1) 50	0 43	9.8 m (32 ft) long; 6.1 m (20 ft) wide; roadway width 4 m (13 ft)	Unlimited vertical	Deck; treated timber		
19	Steam Mill Road	025904	Wolf Creek	(2) 60 (1) 150	60 100	34 m (111 ft 8 in.) long; 7.3 m (24 ft) wide; roadway width 6.7 m (22 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
20	Buena Vista Road	024936	West Fork of Wolf Creek			4.1 m (13 ft 6 in.) long; 9.8 m (32 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical; 9.1 m (30 ft) horizontal	Deck; reinforced concrete	Good	
21	Buena Vista Road	028936	East Fork of Wolf Creek			4.1 m (13 ft 6 in.) long; 11.6 m (38 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical; 9.1 m (30 ft) horizontal	Deck; reinforced concrete	Good	
22	Pine Tree Road	062849	Clear Creek			9 m (29 ft 6 in.) long; 7.9 m (26 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical	Deck	Good	
23 (M9391); Sulphur Spring Bridge	Hourglass Road	054828	Ochillee Creek			31.7 m (104 ft) long; 7.3 m (24 ft) wide; roadway width 5.9 m (19 ft 6 in.)	Unlimited vertical	Deck; reinforced concrete	Good	
24	Hourglass Road	040810	Victory Drive; U. S. 27 and 280, GA 1			61 m (200 ft) long; 8.5 m (28 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical; underbridge vertical 4.5 m (14 ft 11 in.)	Deck; reinforced concrete	Good	Maintenance responsibility of Georgia State Highway Department. Traffic is predominantly military.
25	Victory Drive; U. S. 27 and 280, GA 1	032818	Babbitt Road			31.5 m (103 ft 3 in.) long; 36.6 m (120 ft) wide; roadway width 16.2 m (53 ft 2 in.)	Unlimited vertical; 24.1 m (79 ft 2 in.) horizontal; underbridge vertical 4.3 m (14 ft 2 in.)	Deck; reinforced concrete	Good	
26	8th Division Road	016834	Victory Drive; U. S. 27 and 280, GA 1			64 m (210 ft) long; 10.4 m (34 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical; underbridge vertical 4.7 m (15 ft 6 in.)	Deck; reinforced concrete	Good	Maintenance responsibility of Georgia State Highway Department.
27	Cusseta Highway	982866	Upatoi Creek			151.3 m (496 ft 6 in.) long; 7.9 m (26 ft) wide; roadway width 5.5 m (18 ft)	Unlimited vertical	Deck; reinforced concrete	Good	
28	Victory Drive; U. S. 27 and 280, GA 1	990856	Marne Road			31.8 m (104 ft 4 in.) long; 36.6 m (120 ft) wide; roadway width 27.4 m (52 ft 3 in.)	Unlimited vertical; 25.1 m (82 ft 5 in.) horizontal; underbridge vertical 4.3 m (14 ft 2 in.)	Deck; reinforced concrete	Good	
29	1st Division Road	005846	Victory Drive; U. S. 27 and 280, GA 1			64 m (210 ft) long; 9.8 m (32 ft) wide; roadway width 7.3 m (24 ft)	Unlimited vertical; underbridge vertical 5.2 m (16 ft 11 in.)	Deck; reinforced concrete	Good	Maintenance responsibility of Georgia State Highway Department. Traffic is predominantly military.
30	Victory Drive; U. S. 27 and 280, GA 1 (Southbound)	981866	Upatoi Creek			174.1 m (571 ft 4 in.) long; 12.8 m (42 ft) wide; roadway width 9.8 m (26 ft 2 in.)	Unlimited vertical	Deck; reinforced concrete	Good	
31	Victory Drive, U. S. 27 and 280, GA 1	969869	Custer Road			58.8 m (193 ft) long; 31.7 m (104 ft) wide; roadway width 16.2 m (53 ft 2 in.)	Unlimited vertical; 24.7 m (81 ft 2 in.) horizontal; underbridge vertical 4.3 m (14 ft)	Deck; reinforced concrete	Good	
32	Custer Road	945853	Lindsay Creek Parkway	(2) 39 (1) 39	41 41	87.6 m (287 ft 4 in.) long; 15.8 m (52 ft) wide; roadway width 13.5 m (44 ft 5 in.)	Unlimited vertical; underbridge vertical 5 m (16 ft 6 in.)	Deck; reinforced concrete	Good	
33	Victory Drive; U. S. 27 and 280, GA 1 (Westbound)	951870	Lindsay Creek Parkway	(2) 60 (1) 60	60 60	75.3 m (247 ft 2 in.) long; 15.2 m (50 ft) wide; roadway width 8 m (26 ft 2 in.)	Unlimited vertical; underbridge vertical 5.6 m (18 ft 6 in.)	Deck; reinforced concrete	Good	
34	Victory Drive; U. S. 27 and 280; GA 1 (Eastbound)	951870	Lindsay Creek Parkway	(2) 60 (1) 60	60 60	75.2 m (246 ft 11 in.) long; 15.2 m (50 ft) wide; roadway width 12.3 m (26 ft 2 in.)	Unlimited vertical; underbridge vertical 5.8 m (19 ft 1 in.)	Deck; reinforced concrete	Good	
35	Lindsay Creek Parkway (Southbound)	947846	Upatoi Creek	(2) 44 (1) 44	44 44	152.8 m (501 ft 5 in.) long; 15.2 m (50 ft) wide; roadway width 11.6 m (38 ft 2 in.)	Unlimited vertical	Deck girder; reinforced concrete	Good	
36	River Road	937759	Oswichee Creek			25.7 m (84 ft 4 in.) long; 5.5 m (18 ft) wide; roadway width 4.1 m (13 ft 7 in.)	Unlimited vertical	Deck; treated timber	Good	
37	Victory Drive; U. S. 27 and 280, GA 1 (Northbound)	981866	Upatoi Creek			174.1 m (571 ft 2 in.) long; 12.8 m (42 ft) wide; roadway width 9.8 m (26 ft 2 in.)	Unlimited vertical	Deck; reinforced concrete	Good	
38	NUMBER NOT USED									
39	(Road on Spillway)	064824	Kings Pond Spillway			9 m (29 ft 6 in.) long; 7.3 m (24 ft) wide; roadway width 3.3 m (10 ft 10 in.)	Unlimited vertical	Deck; treated timber	Good	

* W = wheeled vehicles; T = tracked vehicles; (2) = military load classification for two-way traffic; and (1) = military load classification for one-way traffic.

2. RAILROADS

There are three railroads on Fort Benning. The main lines of the Southern Railroad and the Seaboard Coast Line pass through the reservation for interstate connections to southern Georgia and Florida, while the Fort Benning Railroad serves the main cantonment area. Warehouses and approximately 12 kilometers (8 miles) of track are available to the Fort Benning Railroad within the main post. In the Sand Hill cantonment area, a government-owned track connects the Seaboard Coast Line and the Southern Railroad. Total trackage on the reservation is approximately 53 km (33 miles), with the volume of traffic ranging from 100 to 300 cars per month on the Fort Benning Railroad and 300 or more cars per month on each of the other two railroads.

RAILROADS

IDENTIFICATION NUMBER	SEGMENT OF TRACK (GRID REFERENCES)	LENGTH OF SEGMENT	OWNERSHIP OF LINE AND CONDITION OF TRACK	CHARACTERISTICS OF TRACKS	CROSS-OVER LOCATIONS	SIDINGS	BALLAST MATERIAL	VOLUME OF TRAFFIC
Line 1	908827-929872	5.7 km (3.6 miles)	Fort Benning Railroad (government-owned); good condition.	Single track, standard gage (4 ft 8½ in. or 1.44 m). Weight of rails, 39.7 kg/m (80 lb/yd); same weight for siding. Maximum grade of 3% on northern edge of main post.		Several spurs totaling 6.7 km (4.2 miles) long, between grid references 901822-917827.	Crushed slag	100-300 cars per month
Line 2	949890-076803 076794-076774	16.7 km (9.2 miles) 2.7 km (1.7 miles)	Seaboard Coast Line (private); good condition.	Single track, standard gage (4 ft 8½ in. or 1.44 m). Weight of rails, 47.1 kg/m (95 lb/yd); weight of siding rails, 39.7 kg/m (80 lb/yd). All track on reservation government-owned.	Between 974871-977873	175 m (570 ft) long, from 975871-983870; 500 m (1650 ft) long, from 977871-984869; 320 m (1125 ft) long, from 027862-028860; 575 m (1800 ft) long, from 027862-028857; 500 m (1650 ft) long, from 049828-052825.	Crushed slag	300 or more cars per month
Line 3	950890-086810	18.6 km (11.2 miles)	Southern Railroad (private); good condition.	Single track, standard gage (4 ft 8½ in. or 1.44 m). Weight of rails, 57 kg/m (115 lb/yd); weight of siding rails, 39.7 kg/m (80 lb/yd). All track on reservation government-owned.		853 m (2800 ft) long, from 975872-981875; 950 m (3000 ft) long, from 024865-028859; 320 m (1125 ft) long, from 027861-028859; 250 m (825 ft) long, from 053831-054829.	Crushed slag	300 or more cars per month

RAILROAD BRIDGES

IDENTIFICATION NUMBER	LOCATION (GRID REFERENCE)	FEATURE CROSSED	NUMBER OF TRACKS	ROADWAY WIDTH	CLEARANCE HORIZONTAL	CLEARANCE VERTICAL	DECK MATERIAL	OVERALL LENGTH	TYPE OF STRUCTURE	REMARKS
1	921835	Upatoi Creek	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞*	Reinforced concrete	98 m (321 ft)	Deck type	Combined railroad and highway bridge.
2	985869	Upatoi Creek	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	177 m (580 ft)		
3	006881	Upatoi Creek	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	177 m (580 ft)		
4	031856	Ochillee Creek	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	104 m (340 ft)		
5	029855	Stream	Single	4.9 m (16 ft)		∞	Wood	39.6 m (130 ft)		
6	032849	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	26.2 m (86 ft)		
7	047839	Clear Creek	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	27.4 m (90 ft)		
8	045836	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	26.2 m (86 ft)		
9	048831	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	19.5 m (64 ft)		
10	049828	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	23.1 m (76 ft)		
11	053823	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	18 m (60 ft)		
12	057818	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	55 m (180 ft)		
13	072806	Stream	Single	4.9 m (16 ft)	5.2 m (17 ft)	∞	Wood	49 m (160 ft)		

* Unlimited clearance.

3. AIRFIELDS/AIRSTRIPS

There are one major airfield and eleven airstrips on the Fort Benning reservation. Lawson Army Airfield, located south of the main post, provides transient service for military aircraft as well as its mission assigned aircraft. NavAid facilities are provided for instrument operations. The airfield has operational capability to serve all types of military aircraft, including the C-5A Galaxy; however, there are weight restrictions on various access and apron areas.

The airstrips on Fort Benning are not maintained because of their infrequent use; therefore, they are classified nonoperational but are subject to reactivation at any time.

MAP NUMBER AND/OR NAME; LOCATION; TYPE; AND CLASSIFICATION	ELEVATION AND STATUS	RUNWAY DESCRIPTION	TAXIWAY, PARKING, APRON, AND HARDSTAND AREA DESCRIPTION	BUILDING DESCRIPTION	POL FACILITIES	NAVIGATIONAL AIDS	REMARKS
1; Lawson Army Airfield; grid reference 890800; Army airfield	70.7 m (232 ft) Operational	Longest runway: 2500 m long; 46 m wide (8200 ft long; 150 ft wide); azimuth, 140°-320°; maximum weight bearing capacity—S 65, T 220, ST 175, TT 320, TDT 800; asphaltic concrete surface in good condition. Runway 2: 1798.32 m long; 46 m wide (5900 ft long; 150 ft wide); azimuth, 20°-200°; maximum weight bearing capacity, surface material, and condition same as above. Runway 3: 981.45 m long; 24.38 m wide (3220 ft long; 80 ft wide); azimuth, 24°-204°; asphaltic concrete surface in good condition.	Ten taxiways: 18.3 x 1176.5 m (60 x 3860 ft) *; 36.5 x 213.3 m (120 x 700 ft); 18.3 x 658.3 m (60 x 2160 ft); 18.3 x 701 m (60 x 2300 ft); 18.3 x 566.9 m (60 x 1860 ft); 18.3 x 725.4 m (60 x 2380 ft); 18.3 x 786.3 m (60 x 2580 ft) *; 18.3 x 292.6 m (60 x 960 ft); 18.3 x 243.8 m (60 x 800 ft); 18.3 x 2493.2 m (60 x 8180 ft) *; maximum weight bearing capacity same as longest runway where asterisked above; asphalt surfaces. Seven parking aprons, four of which total 475,588 m² (5,129,200 ft²); maximum weight bearing capacity same as longest runway; asphalt surface.	Six hangars: 42.6 x 48.7 m (140 x 160 ft); 54.8 x 60.9 m (180 x 200 ft); 30.4 x 91.4 m (100 x 300 ft); 48.7 x 112.7 m (160 x 370 ft); 60.9 x 73.1 m (200 x 240 ft); 36.5 x 42.6 m (120 x 140 ft); steel frame construction. Two terminal buildings: 42.6 x 42.6 m (140 x 140 ft); concrete construction.	Single point refueling. Grades of fuel: U. S. Aviation Fuel (MIL-SPECS) 115/145, JP-4, U. S. Aviation 0.1 (MIL-SPECS) 1100 (Dispersant reciprocating engine oil) (MIL-L-22851) (Type II); Supporting fluids and systems, AID (antidetonation injection fluid reciprocating engine aircraft).	Control tower, 319 ft above sea level and 26.5 m (87 ft) high. Omnidirectional range (VOR-VHF) instrument landing system; precision approach radar; airfield surveillance radar. Lights: rotating beacon approach lights; high intensity runway and approach lights; sequenced flashing lights.	Minor airframe repairs. Three helipads (see Helicopter Loading Zones). Obstructions: light tower, 330 ft above sea level; tower, 380 ft above sea level. Aerodrome is only partially covered by USAF NOTAM System, but does not maintain a military NOTAM file. For complete aerodrome information civil NOTAM's must be consulted. Runway 3 is used mainly for helicopter landings.
2; Dekkar Strip; grid reference 933730; Army; Airstrip	64 m (210 ft) Nonoperational	1408 m long; 37 m wide (4620 ft long; 120 ft wide); azimuth, 160°-380°; asphalt surface in poor condition.					
3; grid reference 002951; Army; Airstrip	134.1 m (440 ft) Nonoperational	482 m long; 49 m wide (1580 ft long; 160 ft wide); azimuth, 174°-354°; dirt surface in poor condition.					
4; grid reference 993886; Army; Airstrip	109.73 m (360 ft) Nonoperational	518 m long; 30.5 m wide (1700 ft long; 100 ft wide); azimuth, 149°-329°; grass surface in fair condition.		Four small support buildings: 4.3 x 10 m (14 x 34 ft); 6 x 18 m (20 x 60 ft); 6 x 18 m (20 x 60 ft); 6 x 18 m (20 x 60 ft).			
5; grid reference 997826; Army; Airstrip	109.73 m (360 ft) Nonoperational	335.3 m long; 36.6 m wide (1100 ft long; 120 ft wide); azimuth, 90°-270°; grass surface in good condition.		Two small support buildings: 8 x 18 m (26 x 60 ft); 6 x 12 m (20 x 40 ft).			
6; West Todd Field; grid reference 028797; Army; Airstrip	109.73 m (360 ft) Nonoperational	323 m long; 21.3 m wide (1060 ft long; 70 ft wide); 323 m long; 21.3 m wide (1060 ft long; 70 ft wide); 323 m long; 21.3 m wide (1060 ft long; 70 ft wide); azimuth, 35°-215°, bituminous surface in good condition.	Taxiways: 12 x 146 m (40 x 480 ft); 12 x 146 m (40 x 480 ft); surface same as runway; parking areas, aprons, and hardstand areas total 6317 m² (68,000 ft²).	Steel frame hangar: 12 x 60 m (40 x 200 ft); five small support buildings.			
7; East Todd Field; grid reference 037803; Army; Airstrip	115.82 m (380 ft) Nonoperational	323 m long; 16.5 m wide (1060 ft long; 54 ft wide); 323 m long; 16.5 m wide (1060 ft long; 54 ft wide); 323 m long; 16.5 m wide (1060 ft long; 54 ft wide); azimuth, 94°-274°; bituminous surface in good condition.	Taxiways: 12 x 146 m (40 x 480 ft); 12 x 146 m (40 x 480 ft); 12 x 76 m (40 x 260 ft); bituminous surface in good condition.	Two steel frame support buildings: 12 x 61 m (40 x 200 ft); 30 x 43 m (100 x 140 ft).			
8; grid reference 065837; Army; Airstrip	132 m (433 ft) Nonoperational	1200 m long; 45 m wide (3900 ft long; 150 ft wide); azimuth, 80°-260°; bituminous surface in poor condition.	Taxiways: 15 x 701 m (50 x 2300 ft); 15 x 104 m (50 x 340 ft); 15 x 85 m (50 x 280 ft); bituminous surface in fair condition. Hardstand area: 58.53 m² (630 ft²).	Six support buildings.			
9; grid reference 075720; Army; Airstrip	115.82 m (380 ft) Nonoperational	463 m long; 67 m wide (1520 ft long; 220 ft wide), azimuth 15°-195°; grass surface in fair condition.					
10; grid reference 056714; Army; Airstrip	109.73 m (360 ft) Nonoperational	530 m long; 12 m wide (1740 ft long; 40 ft wide); azimuth, 32°-212°; grass surface in good condition.					
11; Concord Landing Strip; grid reference 151888; Army; Airstrip	146.3 m (480 ft) Nonoperational	277 m long; 24 m wide (900 ft long; 80 ft wide); azimuth, 130°-310°; bituminous surface in poor condition.					
12; Cactus Landing Strip; grid reference 175833; Army; Airstrip	164.6 m (540 ft) Nonoperational	287 m long; 24 m wide (940 ft long; 84 ft wide); azimuth, 105°-285°; bituminous surface in poor condition.					

Note: Runway weight bearing capacity (gross weight of aircraft) is determined by adding 000 to figure following S, T, ST, TT, TDT. Runway weight bearing capacity given is for unlimited operations. Aircraft weight higher than given requires prior permission from aerodrome controlling authority.

S - Runway weight bearing capacity for aircraft with single-wheel type landing gear (C-47, F100).
T - Runway weight bearing capacity for aircraft with twin-wheel type landing gear (C-9A).
ST - Runway weight bearing capacity for aircraft with single-tandem landing gear (C-130).
TT - Runway weight bearing capacity for aircraft with twin-tandem type (includes quadricycle) landing gear (B-52, C-135).
TDT - Runway weight bearing capacity for aircraft with twin-delta tandem landing gear (C-5).

For further information, see DOD Flight Information Publication (enroute IFR-Supplement United States).

4. INLAND WATERWAYS

The Chattahoochee River is navigable for barge traffic from the Gulf Intracoastal Waterway to Columbus, Georgia (Mile Point 155); the channel is 2.86 meters (9 ft) deep and 30 meters (100 ft) wide. The Georgia Ports Authority has built an inland barge terminal in Columbus, which includes a 121-meter (400 ft) reinforced concrete wharf, a 2787-square-meter (30,000-sq-ft) warehouse and 33.19 hectares (82 acres) of industrial site property. This terminal facility is the closest heavy equipment barge port to the Fort Benning reservation.

NAME	LOCATION	NAVIGATION SEASON	LENGTH	TYPE OF WATERWAY	CHANNEL CHARACTERISTICS	REMARKS
Chattahoochee River	From grid reference 909839 to 966689 Mile points from 130.3 to 146.4	Open year-round	25.7 km (16 miles)	Channelized river	Minimum width, 30.48 m (100 ft); average width, 30.48 m (100 ft); safe draft 2.7 m (9 ft); current velocity controlled by dam on Walter F. George Reservoir to the south. Bottom materials generally sandy and silty.	Numerous navigational buoys along the channel at Fort Benning. Obstructions—Map No. 1, submerged gas main at Mile Point 145.2; Map No. 2, submarine telephone cable at Mile Point 141.7; Map No. 3, overhead cable with vertical clearance 12.2 m (40 ft) over high water at Mile Point 140.9.

INLAND WATERWAY BRIDGE

(SEE ROADS AND RAILROADS SECTIONS FOR OTHER INFORMATION ON BRIDGE)

MAP NUMBER AND NAME	LOCATION	CONTROLLING CLEARANCES
1; General Eddy Highway Bridge	Grid reference 883777; Mile Point 141	Horizontal, 46 m (150 ft); vertical, 11 m (37 ft) at high-water reading of 193.6 ft.

5. HELICOPTER LANDING ZONES

MAP NUMBER AND/OR NAME	LOCATION (GRID REFERENCE)	DIMENSIONS	AZIMUTH	ELEVATION	SURFACE MATERIAL	RESTRAINTS	REMARKS
1; at Lawson Army Airfield	880797	52 x 104 m (170 x 340 ft)	96°-276°	71 m (232 ft)	Asphaltic concrete	Two towers at Lawson Airfield, 330 and 370 ft above sea level	
2; at Lawson Army Airfield	895796	52 x 85 m (170 x 280 ft)	96°-276°	71 m (232 ft)	Asphaltic concrete		
3; at Lawson Army Airfield	896789	26 x 190 m (84 x 620 ft)	140°-320°	71 m (232 ft)	Asphaltic concrete		
4; at Hospital	949839	100 x 100 m (328 x 328 ft)	0°-180°	122 m (400 ft)	Bituminous	Hospital building, 450 m (1476 ft) south of pad	Access road to hospital and highway (Santa Fe Road).
5; Munsan Field, Kelly Hill Heliport	981844	Three pads—300 x 300 m (984 x 984 ft)	160°-340°	140 m (460 ft)	All bituminous		Nonoperational control tower 440 ft above sea level.
		300 x 300 m (984 x 984 ft)	60°-240°	131 m (430 ft)			
		300 x 300 m (984 x 984 ft)	160°-340°	134 m (440 ft)			
6	010824	200 x 200 m (656 x 656 ft)	0°-180°	122 m (400 ft)	Oil-treated pad (deteriorated)		Nonoperational as of 23 March 1973.
7	011825	200 x 200 m (656 x 656 ft)	66°-246°	122 m (400 ft)	Oil-treated pad (deteriorated)		Nonoperational as of 23 March 1973.
8; McKenna Leyte Heliport	055831	305 x 335 m (1000 x 1100 ft)	80°-260°	98 m (320 ft)	Bituminous		Nonoperational; two support buildings.
9	065835	122 x 122 m (400 x 400 ft)	80°-260°	132 m (433 ft)	Grass		Nonoperational.
10	172793			177 m (580 ft)	Grass		Nonoperational.
11	057891	85 x 116 m (280 x 380 ft)	46°-226°	95 m (310 ft)	Grass		
12	029769	37 x 104 m (120 x 340 ft)	150°-330°	95 m (310 ft)	Grass		
13	885769	18 x 73 m (60 x 240 ft)	110°-290°	107 m (350 ft)	Grass		

6. DROP ZONES

NUMBER AND NAME	LOCATION (GRID REFERENCE)	DIMENSIONS	AZIMUTH	ELEVATION	SURFACE DESCRIPTION	AIRCRAFT OBSTRUCTIONS	REMARKS
1; Fryar Field	920720	2725 x 1180 m (8940 x 3871 ft)	163°-343°	85 m (280 ft)	Grass	Power line west of site	Improved dirt and hard-surface roads provide access to area. Improved dirt roads cross drop zone.
2; Lee Field	076896	1200 x 900 m (3937 x 2953 ft)	97°-277°	91 to 96 m (300 to 320 ft)	Sand	None	Hard-surfaced road on northwest side of area.

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

LINES OF COMMUNICATION

ROADS

- Hard surfaced road, 4 lanes
- Hard surfaced road, 2 lanes
- Tank trail
- Improved dirt road
- Unimproved dirt road
- 27 — Federal route number
- 26 — State route number

BRIDGE DATA
(All Measurements in Meters)

- A. Bridge number
- B/C. Military load classification
- D. Roadway width
- E. Length
- ∞ Unlimited vertical clearance
- One-way traffic
- Two-way traffic
- T Tracked vehicle

Note: For additional road and bridge data, see tables in text; included is the Military Load Classification for wheeled vehicles.

RAILROADS

- 1 — Railroad and identification number

Railroad Bridge

- A. Bridge number
- B. Vertical clearance
- C. Horizontal clearance
- D. Length

Number on map refers to entry in table.

AIRFIELDS/AIRSTRIPS

- 2 — Airfield
- 3 — Airstrip

Number on map refers to entry in table.
Orientation of runway is indicated by the placement of airfields or airstrips.

INLAND WATERWAYS

- Navigable Channel
- 146.4 — Mile Point
- Bridge (See Bridge table)
- 4 — Obstruction (See Remarks in table)

Number on map refers to entry in table.

HELICOPTER LANDING ZONES

- H 7 — Landing Zone

Number on map refers to entry in table.

DROP ZONES

- DZ 1 — Drop Zone

Number on map refers to entry in table.

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia.
Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

K. URBAN AREAS (CANTONMENT AREAS)

TROOP BILLETS

TYPE	CAPACITY	CURRENT LOAD	REMARKS
Permanent	11,000	11,000	Old mobilization-type barracks are being continually demolished, especially in the Sand Hill area of the post. There are two permanent brigade complexes on the Main Post and one at Kelley Hill.
Temporary	9,000	2,500	Seven modern barracks housing 1150 men each are to be constructed before 1980 in the Sand Hill Area. This new barracks project includes: Reception Center 682 men; Basic Training Center 8960 men; Trainee Center Cadre 400 men

QUARTERS

TYPE	CAPACITY	CURRENT LOAD	REMARKS
BOQ			These consist of 10 buildings, 2 of which are "VIP" in type, for general and field grade officers. Three of the buildings make up two "cuarteles," one divided and one undivided, which account for 1076 of the total 1176 current load. The capacity figure as given is in terms of beds rather than units. If current standards requiring a private bath and minimum 200 sq ft per man are applied, the capacity is reduced to a figure equal to current load.
Permanent	1697	1176	
Temporary	(46 buildings)	(Not in use)	
BEQ			No BOQ's are now specifically designated for female officers, although three buildings at the Martin Army Hospital were formerly limited to nurses' housing.
Permanant	106	95	Continuing modernization of the smaller and older BOQ's is programmed. Latest information indicates, however, that the following programmed MCA projects will not be funded: conversion of a third cuartel which is presently occupied by administrative offices and building of new 300-man and 325-man buildings. Due to the fact that in the past the ratio of commissioned to enlisted personnel has been exceptionally high at Fort Benning, it is now believed that BOQ facilities are in adequate supply for future needs.
			Two buildings on the Main Post are used as BEQ's for senior NCO's, and one of the three buildings originally intended for nurses at the Martin Army Hospital is now used for enlisted WAC's.
			In the large modern barracks used for troop housing, sections are reserved to serve as the equivalent of BEQ's for senior NCO's.

UTILITIES

SUBSTATION	TRANS-FORMERS	CAPACITY	CURRENT LOAD	REMARKS
Marne Road	3 - 12,500	37,500 kva		Electric power is supplied by the Georgia Power Co., which brings two 110-kv feeders to their Marne Road substation where it is transformed to 43.8 kv, metered, and fed to the adjacent US Government-owned substation. Georgia Power Co. has two transformers in their Marne Road substation, one 50,000 kilovolt-ampere (kva) and the other 20,000 kva. A first "44-kv loop" distributes power to Sand Hill, Harmony Church, and the Martin Army Hospital substations, with a spur to Kelley Hill, and then back to the Marne Road substation. A new 44-kv loop completed in 1976 circles the Main Post and feeds the Baltzell Avenue and Mann Field substations. All Government-owned substations transform 43.8 kv to 12.47/7.2 kv.
Mann Field	2 - 12,500	25,000 kva		
Baltzell Avenue	2 - 12,500	25,000 kva		
Sand Hill	2 - 7,500	15,000 kva		
Martin Army Hospital	1 - 8,500	8,500 kva		
Harmony Church	1 - 7,500	7,500 kva		
Kelley Hill	1 - 5,000	5,000 kva		
TOTAL		123,500 kva	146,646,000 kw hours (1974-75 full year total)	There are also standby generators in critical locations to be used in emergency situations.
				Electrical consumption in the peak month (August) is 18,400,000 kw hours, and in the lowest month (March) is 8,768,000 kw hours.
				The present electric distribution system is in excellent condition, and the capacity is considered adequate for future needs.

NATURAL GAS

CAPACITY	CURRENT LOAD	REMARKS
6,540,000 cu ft per day is a guaranteed supply per agreement with Columbus, GA, Gas Light Co.	Current usage varies between about 4,000,000 cu ft per day in slack (summer) months to about 9,000,000 cu ft per day in winter months.	About 60 percent of heated buildings on Fort Benning utilize natural Gas. Gas is the fuel on Main Post, Family Housing Area, Martin Army Hospital, and Kelley Hill. No. 6 fuel oil and liquid propane are used in Harmony Church and Sand Hill.
7,488,000 cu ft natural gas equivalent is maximum capacity of the propane-air peak shaving plant on post, available to augment the natural gas supplied by the Gas Light Co.		There are about 10 central heating plants and 20 boilers. There are eight central cooling plants.
		Gas curtailment during times of heavy demand may be imposed upon the Columbus Gas Light Co. by its supplier, the Southern Natural Gas Co. During such curtailment periods, the natural gas supply is augmented by the propane-air peak shaving plant. However, use of this plant is kept to a minimum due to the higher cost of the propane-air mixture. Also, a number of the steam plants utilize No. 6 oil for fuel during curtailment periods.
		Distribution lines, except in the Family Housing Area, are owned by the US Government. Approximately 80 percent of the natural gas distribution system contains coated and wrapped steel lines. The overall condition of the gas distribution system is considered to be good to excellent and adequate to meet future demands.
		Because of the impending shortage of natural gas, current Army directives state that all new boiler plants are to use fuel other than gas, and also all large central heating plants are to be converted to oil or coal.

SEWERAGE

PLANT NO. AND LOCATION	CAPACITY	AVERAGE DAILY FLOW	PEAK RECORDED FLOW	REMARKS
1 Main Post	4.62 mgd	1.3 mgd	3.0 mgd	Complete primary and secondary treatment of sewage is provided by three plants. Effluent from Plants Nos. 1 and 2 is discharged into the Chattahoochee River, and from Plant No. 3 into Mill Creek. Sand Hill sewage is directed to the Main Post plant.
2 Lawson AAF	2.98 mgd	2.1 mgd	4.1 mgd	Since Plant No. 2 has been hydraulically overloaded, its capacity is being expanded in 1976 by 1.0 mgd. All plants must undergo major modification in order to meet EPA standards by 1977. This is not considered economically feasible in the case of Plant No. 3, which will be used only as a pumping station and its flow will be directed to Plant No. 1.
3 Harmony Church	1.9 mgd	0.2 mgd	0.9 mgd	With a stable population, no overall increase in capacity is considered necessary.

RECREATION FACILITIES

FACILITY	CAPACITY AND LIGHTING	REMARKS
Doughboy Football Stadium	808 seats (night-lighted)	There are also combination play courts, basketball, volley ball, and tennis courts in each barracks area. Indoor facilities include three bowling alleys (60 lanes) and one indoor swimming pool.
Gowdy Baseball Field	3786 seats (night-lighted)	Future plans for recreation development include the expansion of Briant Wells Field House, the upgrading and renovation of Doughboy Stadium, and possibly the building of five additional gymnasiums. The new Training Center facilities now being built at Sand Hill are expected to include, by 1980, a new swimming pool and new game courts.
Bennett Baseball Field (Sand Hill)	Night-lighted	
Briant Wells Field House		
3 other baseball fields	Unlighted	
14 softball fields	Night-lighted	
16 softball fields	Unlighted	
2 golf courses		
Trapshooting facility		
French Field (polo grounds)		
8 swimming pools		
Small boat recreation facilities	2 ramps	

FAMILY HOUSING

TYPE OF QUARTERS	NUMBER OF BUILDINGS	NUMBER OF FAMILY UNITS	YEAR OF CONSTRUCTION	TYPE OF CONSTRUCTION FUNDS	REMARKS
General	202	202	1923-1939	MCA	Authorized military personnel at Fort Benning are assigned family quarters in a variety of two-, three-, and four-bedroom type designs consisting of single units, duplexes, and multifamily units. All the family housing is classified as permanent and is as follows:
Colonel	35	70	1923-1930	MCA	
Lt Col Major	30	120	1934-1935	MCA	
CGO/WO	5	10	1923	MCA	
CGO/WO	10	20	1957	MCA	
CGO/WO	100	100	1957	Wherry	
CGO/WO	124	248	1958	Capehart	
CGO/WO	80	160	1963	Capehart	
CGO/WO	16	80	1971	MCA	
CGO/WO	87	174	1975	MCA	
NCO	101	101	1930-1934	MCA	
NCO	10	80	1950	MCA	
NCO	57	150	1952	MCA	
NCO	10	80	1957	MCA	
NCO	213	550	1957	Wherry	
NCO	94	752	1958	Capehart	
NCO	70	140	1963	Capehart	
NCO	70	300	1969	MCA	
NCO	61	200	1970	MCA	
NCO	55	260	1972	MCA	
NCO	150	300	1975	MCA	
Civilian	1	1	1940	MCA	As of May 1976, 4002 of the 4098 family units were occupied, 93 were vacant but ready for occupancy, and 3 were vacant but required some rehabilitation work.
TOTAL	1581	4098			The 202 family units classified as general quarters are so designated based on square foot criteria, but most of these quarters are presently occupied by field grade officers. No additional family housing units are presently being constructed, but improvements to the older units are continually required to meet modern-day amenity standards.

WATER SUPPLY

TYPE	CAPACITY	CURRENT LOAD	REMARKS
Supply:			
Upatoi Creek	433 mgd mean daily flow	4.7 mgd (average daily domestic water demand)	20-year record minimum flow is 16.2 mgd. Peak daily domestic demand is 11.74 mgd, and daily fire demand is 0.63 mgd, making a peak required daily water supply of 12.4 mgd. Both of these sources are available for drawing water in emergency situations.
Chattahoochee River Impounded lower Lake Walter F. George			
Wells	0.114 mgd		There are five small wells on the reservation, from which some water is supplied for training and recreation areas. Water supply in general is adequate, but upstream storage on the Upatoi should be provided for those periods when the streamflow may not be sufficient.
Treatment:			
Water treatment plant	12 mgd		Emergency capacity rate for a 24-hour period is 18 mgd. The clear well at the water treatment plant is considered as part of the distribution system and has capacity of 2,000,000 gal. The plant is only marginally adequate for the current effective population of 31,300. Changes are being made (addition to sludge drying bed, construction of a sedimentation wastewater lagoon, and a filter backwash wastewater lagoon) to meet EPA regulations.
Storage:			
Water intake dam reservoir	20,000,000 gal		
Underground reservoirs	Two of 1,000,000 gal each		One at Harmony Church, one at Sand Hill.
Steel standpipe	1,000,000 gal		Main Post.
Steel elevated tanks	3,735,000 gal in total of nine tanks		The total water storage is presently sufficient to handle an increase in effective population of only 1177 persons.
			Average water pressure is 80 psig, carried in a network of mains from 3 in. to 20 in. in diameter. Most of the pipe is cast iron, but there are sections of steel and asbestos cement pipe. The distribution system does not have cathodic protection. The major deficiency in distribution is in relation to fire protection capability, which is not adequate in certain areas.

TELECOMMUNICATIONS

TYPE	CAPACITY	REMARKS
Unofficial Telephone:		Service provided by the Southern Bell Telephone Company. Has expansion capacity of 1000 more lines.
Milliken Central Exchange	118 incoming trunks 57 outgoing trunks 8 telephone operator positions 4 information positions 4000 lines	Is interconnected by trunks with the Southern Bell system to facilitate toll-free calling between the separate systems. An existing cable will serve the new barracks program at Sand Hill.
		Located in a temporary building, a 1942 mobilization-type structure in rather poor condition. Must be either replaced or its activities curtailed in the near future.
Official Telephone:		Installed under a lease-license arrangement which expires on 31 Dec 1983. Service is planned for all residential and troop housing areas.
Main Post Telephone Exchange	80 outgoing trunks 3-position test board 6000 lines of automatic electric dial central office equipment	These facilities were recently relocated to Building 84, adjoining the Main Post telephone exchange.
Harmony Church Telephone Exchange	1400 lines of automatic electric dial equipment	
Community Antenna Television (CATV)		
Military Amateur Radio Service (MARS)		

SCHOOLS AND MEDICAL FACILITIES

TYPE	CAPACITY	CURRENT LOAD	REMARKS
Schools:			
Nursery/Kindergarten	10 rooms	218	This school expects to add one classroom in 1977, and to have an increased enrollment to about 240. In addition, there is a Tot Town Nursery School operated privately by officers' wives, with capacity and current load figures not available.
Elementary	158 rooms, in 7 schools: Wilbur Wilson Herbert J. Dexter Edward A. White Don Faith Frank Lloyd Morris R. McBride	2881 (1 June 1976)	Elementary school enrollment is projected to be 3126 in 1977 and 3250 by 1980.
High	None		High school students living on the post presently bus to Muscogee County high schools. Current number of such students not known. A parcel of Government land just adjacent to the post (southwest corner of Santa Fe Road and Victory Drive) was excessed in 1975 to the school district for a future high school, which may be constructed by September 1978.
Medical Facilities:			
Martin Army Hospital	500 beds		Can be expanded to 1000 beds by the addition of two nine-story wings for additional ward space. Served by heliport.
Temporary Medical Centers (Dispensaries) (Permanent buildings)	2 units (Main Post) 2 units (Kelley Hill)		Most of the 17 temporary dispensaries scattered throughout the post's cantonment areas at the end of 1975 were scheduled for demolition, and some have already been razed in 1976. 1978 construction program at Sand Hill includes two new temporary medical centers and a diagnostic center.
Dental Clinic (Permanent buildings)	68 chairs in 4 clinics		Permanent dental clinics at Main Post (Wold Avenue): 22 chairs; Main Post (Sightseeing Road): 28 chairs; Kelley Hill: 12 chairs; and Martin Army Hospital: 6 chairs.
Dental Clinics (Temporary buildings)	44 chairs in 4 clinics		Located at Harmony Church and Sand Hill in old, substandard buildings which are due to be razed.
Dental Laboratory	1 unit (Main Post)		A new permanent dental clinic with seven chairs is planned at Martin Army Hospital and a new permanent 28-chair facility is being constructed at Sand Hill to replace the existing ones.

MAIN POST

AREA FEATURES

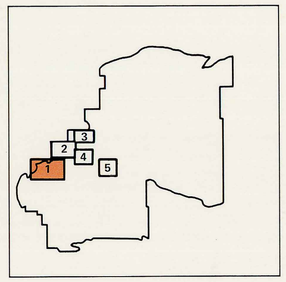
- Family Housing, Officers
- Family Housing, NCO
- Family Housing, Officer and NCO
- Barracks
- Bachelor Officers Quarters
- Bachelor Enlisted Quarters
- Guest Houses, Temporary Quarters
- Parade Ground
- Recreation Facilities

SITE FEATURES

1. Post Headquarters
2. Post Hospital
3. Officer's Open Mess
4. Post Exchange
5. Commissary
6. Post Office
7. Elementary School
8. Chapel
9. Directorate of Facilities Engineering
10. Telephone Exchange
11. Sewage Treatment Plant
12. Electric Power Substation
13. Propane Air Gas Plant
14. Water Filtration Plant
15. MARS Facility
16. Water Heating Plant
17. Water Chilling Plant
18. Thermo Plant
19. Potential Hazard to Aerial Navigation

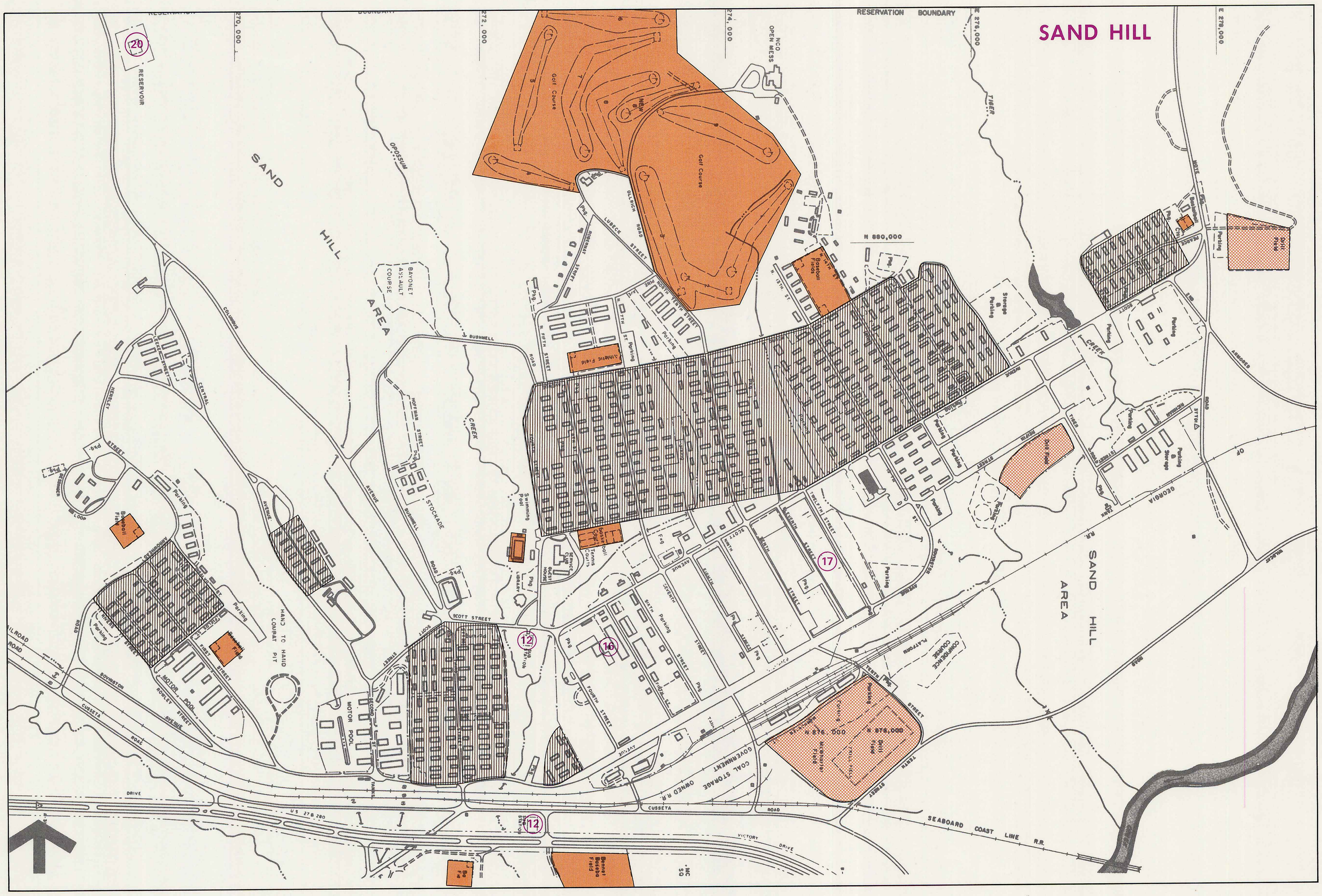
Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

LOCATION DIAGRAM



1. Main Post
2. Family Housing
3. Sand Hill
4. Kelly Hill
5. Harmony Church

URBAN AREAS (CANTONMENT AREAS)



AREA FEATURES

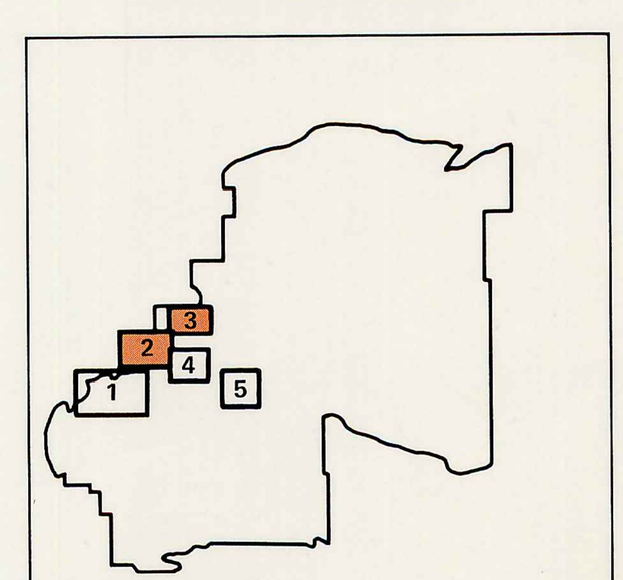
- Family Housing, Officers
- Family Housing, NCO
- Family Housing, Officers and NCO
- Barracks
- Parade Ground
- Recreation Facilities

SITE FEATURES

- (3) Officers Open Mess
- (7) Elementary School
- (12) Electric Power Substation
- (16) Water Heating Plan
- (17) Water Chilling Plant
- (19) Potential Hazard to Aerial Navigation
- (20) Underground Water Reservoir

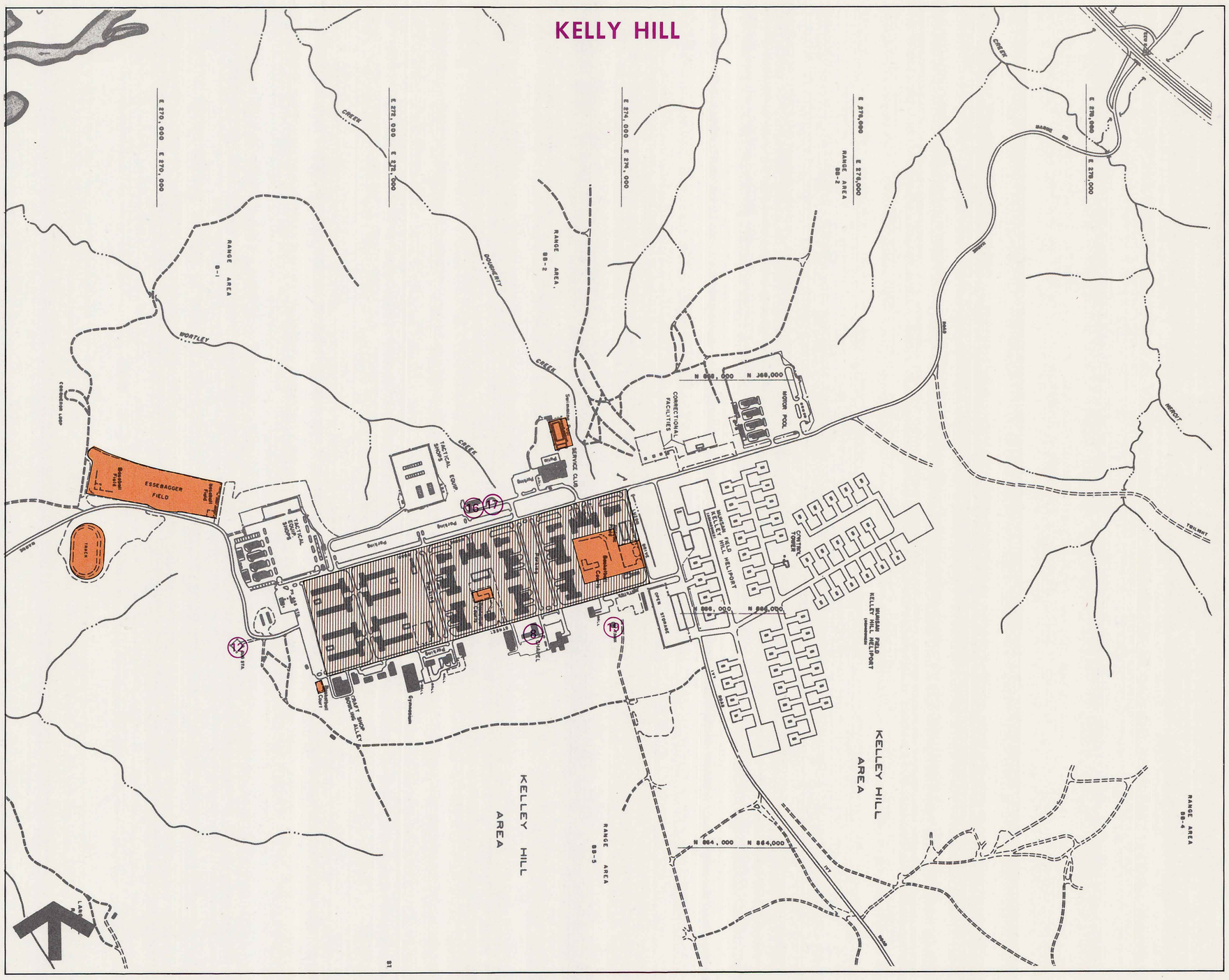
Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

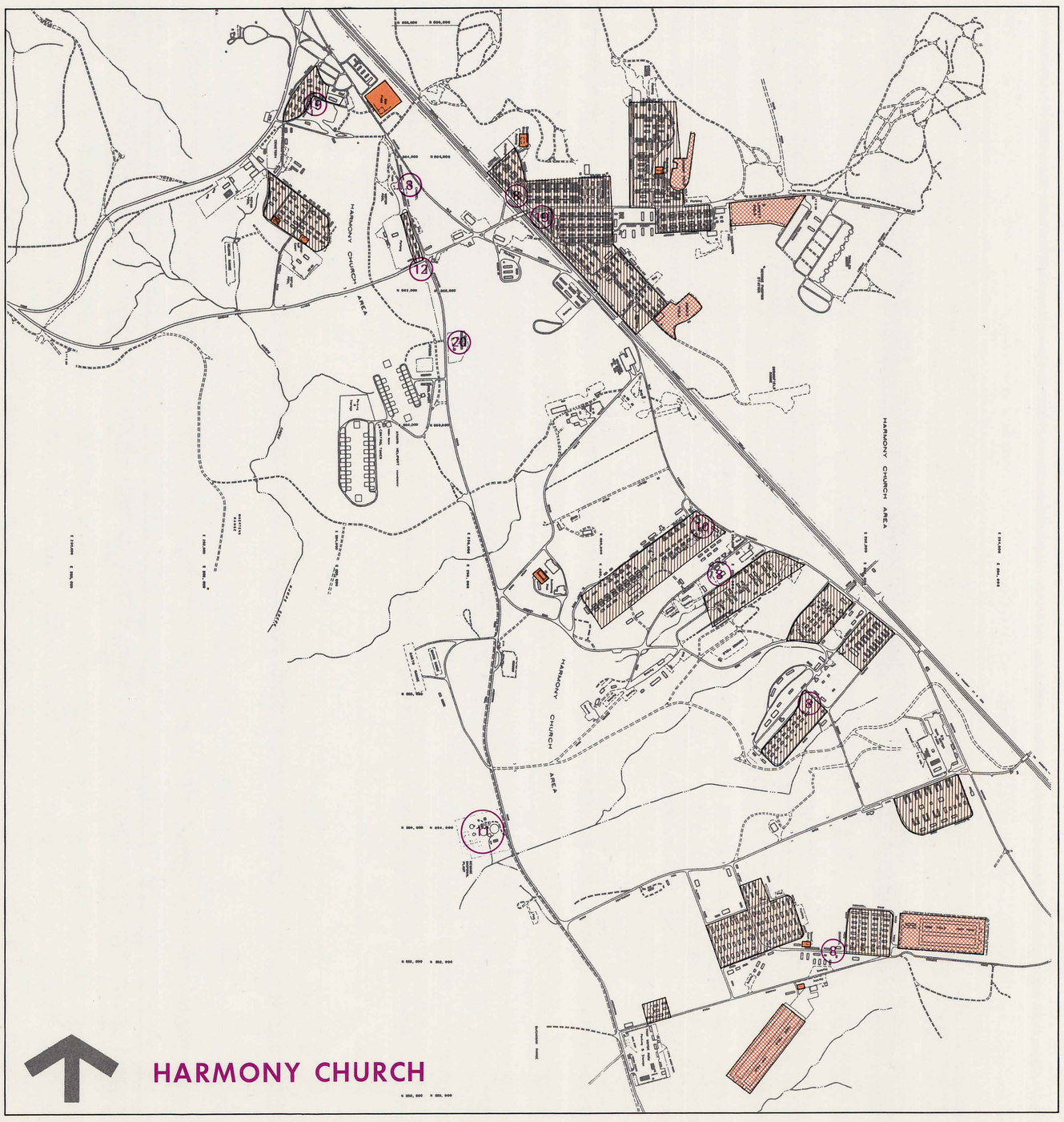
LOCATION DIAGRAM



1. Main Post
2. Family Housing
3. Sand Hill
4. Kelly Hill
5. Harmony Church

URBAN AREAS (CANTONMENT AREAS)





HARMONY CHURCH

AREA FEATURES

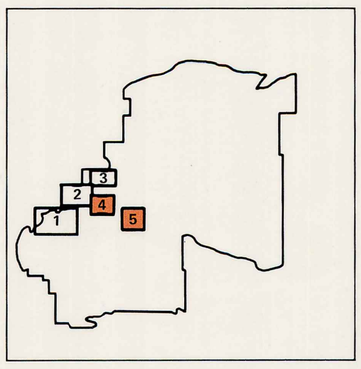
- Barracks
- Parade Ground
- Recreation Facility

SITE FEATURES

- (8) Chapel
- (10) Telephone Exchange
- (11) Sewage Treatment Plant
- (12) Electric Power Substation
- (16) Water Heating Plant
- (17) Water Chilling Plant
- (19) Potential Hazard to Aerial Navigation
- (20) Underground Water Reservoir

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

LOCATION DIAGRAM



1. Main Post
2. Family Housing
3. Sand Hill
4. Kelly Hill
5. Harmony Church

L. NON-URBAN CULTURE FEATURES

MAP NUMBER	GRID REFERENCE	DESCRIPTION
1	079031	Borrow Pit*
2	094028	2 Buildings**
3	100033 103032	2 Buildings
4	(3) 045012 (1) 049017	4 Buildings
5	063012	Building
6	074019	Building
7	074019	Revetment; length, 213 m (700 ft)
8	076018 076020	2 Buildings
9	076017	Revetment; length, 256 m (840 ft)
10	076016	Building
11	111007	Cemetery
12	111996	Cemetery
13	116998	2 Buildings
14	116997	Observation Tower; height, 9 m (30 ft)
15	032989 037995	2 Buildings
16	143982	Building
17	(1) 063969 (3) 068970	4 Buildings
18	119969	Gravel Pit
19	117964	Cemetery
20	117963 118963	2 Buildings; (117963) 12 m x 6 m x 8 m (40 x 20 x 26 ft)
21	181965 196968	2 Buildings
22	023957	Sand Pit
23	086955	Cemetery
24	105950	Carmouche Range; length of revetments, 500 m and 94 m (1640 and 310 ft)
25	109949 114947	2 Buildings; (114947) 12 m x 6 m (40 x 20 ft)
26	136943	Sand Pit
27	009942	Cemetery
28	010941	Building
28A	022936	3 Buildings
28B	023935	Revetment; length, 286 m (940 ft)
28C	022935	Observation Tower; height, 5 m (15 ft)
29	042936	Revetment; length, 98 m (320 ft)
29A	031934	Observation Tower
29B	030935 033933	2 Buildings
29C	042936	Sand Pit
30	047938	2 Buildings
31	080939	3 Buildings
32	082935	3 Buildings
33	085933	3 Buildings
34	100943	9 Buildings; (100944) 21 m x 6 m (70 x 20 ft)
35	198938	2 Buildings
36	015933	Cemetery
37	017934	Observation Tower
38	018933	Revetments; length, 55 m (180 ft)
39	016933	3 Buildings
40	015932	Revetment; length, 37 m (120 ft)
41	015932	Observation Tower
42	051924	4 Buildings
43	084926	Cemetery
44	091926	Revetments; Darby Range, length, 222 m (730 ft)
45	136926	Cemetery
46	998909	Cemetery
47	999909	Borrow Pit
48	014904	Cemetery
49	063913	Observation Tower
50	063913	3 Buildings
50A	061910	Revetment; length, 274 m (900 ft)
51	063906	Observation Tower
52	091918	Building
53	087909	Building
54	102918	Building
55	103919	Cemetery
56	127917	Sand Pit
57	179921	Gravel Pit
58	193916	Cemetery
59	042903	Clay Pit
59A	061904	Revetments; length, 360 m and 189 m (1180 and 620 ft)
60	064904	Borrow Pit
61	133906	Building
62	144906	2 Buildings; 5 m x 5 m (18 x 18 ft) and 6 m x 5 m (20 x 18 ft)
63	145907	3 Buildings
64	155901	Grandstand
65	156901	2 Buildings
66	989886	Grandstand
67	993888	2 Buildings; 15 m x 6 m (50 x 20 ft)
68	993884 993885	2 Buildings; (993885) 34 m x 9 m (110 x 30 ft)
69	(2) 009894 (2) 011894	4 Buildings
70	023894	Abandoned Airfield; length, 450 m (1350 ft), width, 45 m (150 ft)
70A	027892	Revetments; length, 177 m (580 ft)
70B	027889	2 Buildings
70C	034891	Revetment; length, 171 m (560 ft)
71	034893	Sand Pit
71A	036891	Revetments; length, 298 m and 171 m (980 and 560 ft)
71B	(2) 034890 (3) 035885 (2) 036889	7 Buildings
71C	036884	Revetment; Frey Range, length, 445 m (1460 ft)
72	046892	Sand Pit
73	048893	Revetments; length, 372 m and 91 m (1220 and 300 ft)
74	(6) 048892 (3) 048889	9 Buildings
75	048889 048888	Revetments; length, 256 m and 165 m (840 and 540 ft)
76	058891	BSA Camp Barnett
77	058894	Borrow Pit
78	064892	TIS Camp
79	061900	Revetments; length, 292 m (960 ft)
80	064900	2 Buildings
81	061898	12 Buildings
82	074898	Observation Tower; height, 9 m (30 ft)
83	097886	Borrow Pit
84	117894	3 Buildings
85	119897	Building
86	147892	Observation Tower; height, 21 m (69 ft)
87	153900	2 Buildings
88	121887	4 Buildings; (122886) 11 m x 5 m (36 x 18 ft)
89	138883	Ruins
90	166880	Buildings
91	190887	4 Buildings; 12 m x 6 m x 11 m (40 x 20 x 35 ft) and 18 m x 8 m (58 x 26 ft)
92	194886	Building
92A	972870	Sandhill Electric Substation
93	991862	Sand Pit
94	991864	Sand Pit
95	995860	Sand Pit
96	017858	Sand Pit
97	021858	Clay Pit
98	022857	Borrow Pit
99	026858	Clay Pit
100	030864	Revetment; length, 225 m (740 ft)
101	030863	3 Buildings
102	050868	3 Buildings
103	050867	Grandstand
104	050867	Observation Tower; height, 5 m (15 ft)
105	110871	3 Buildings
106	157853	Ruins
107	199873	Ruins
108	200866	Ruins
109	908830	Sand Pit
110	911836	Sand Pit
110A	925828	Baltzell Avenue Substation
110B	930836	Marne Road Substation
110C	947832	Martin Army Hospital Substation
110D	965841	Kelley Hill Substation
111	012840	Borrow Pit
112	056847 056849 059848	3 Buildings
113	059865	Grandstand
114	059865	Observation Tower; height, 5 m (15 ft)
115	076865	Building
116	072845	3 Buildings
117	075846	2 Buildings
118	075847 077847	2 Grandstands
119	084842	2 Buildings
120	084841	Observation Tower
121	110850 111850	2 Sand Pits
122	115841	2 Buildings
123	181837	Sand Pit
124	189843	Sand Pit
125	201841	Sand Pit
125A	012831	Harmony Church Substation
126	038834	Sand Pit
127	042828	Sand Pit
128	046827	Sand Pit
129	052818	Grandstand
130	068825	2 Buildings; 25 m x 18 m (82 x 60 ft)
131	108824	Ruins
132	111824	Ruins
133	123828	Cemetery
134	124828	Building; 17 m x 7 m (56 x 22 ft)
135	131821	Sand Pit
136	159830	Sand Pit
137	161830	Building
138	911800	Revetment; length, 274 m (900 ft)
139	910801 912803	7 Buildings
140	914805 918808	11 Buildings; (916806) 17 m x 9 m (55 x 30 ft) and (919807) 18 m x 9 m (60 x 30 ft)
141	921806	Revetment; length, 591 m (1940 ft)
142	(1) 921810 (5) 924811	6 Buildings
143	925808	Revetment; length, 549 m (1800 ft)
144	935813 936811	2 Borrow Pits
145	938811	4 Buildings; 12 m x 7 m (38 x 22 ft)
146	938811	Grandstand
147	938811	Observation Tower
148	945813 948815	8 Buildings; (943813) 13 m x 7 m (44 x 24 ft), (945814) 9 m x 6 m (28 x 20 ft), (946814) 17 m x 20 m (56 x 20 ft), and (947815) 9 m x 6 m (28 x 20 ft)
149	948815	Observation Tower; height, 6 m (20 ft)
150	949816	3 Buildings; 6 m x 6 m (20 x 20 ft), 14 m x 6 m (46 x 20 ft), and 17 m x 6 m (56 x 20 ft)
151	949816	Observation Tower; height, 6 m (20 ft)
152	956814	2 Buildings
153	952818 954821	6 Buildings
153A	955821	2 Grandstands
154	957824	Borrow Pit
155	966822	4 Buildings; 17 m x 6 m (55 x 20 ft)
156	966822	Observation Tower; height, 5 m (17 ft)
157	(1) 970825 (2) 974826	3 Buildings
158	972826	Grandstand
159	984823	3 Buildings
160	984823	Grandstand
161	984823	Observation Tower
162	991823 991825	2 Grandstands
163	(1) 991823 (3) 996826	4 Buildings
164	996826	Grandstand
165	991823	Observation Tower
166	002822	3 Buildings
167	001819	Revetments; length, 445 m and 165 m (1460 and 540 ft)
168	001817	2 Buildings
169	(1) 908795 (1) 909797 (2) 914794	4 Buildings; (908795) 14 m x 6 m (45 x 20 ft) and (909797) 21 m x 9 m (70 x 30 ft)
170	914802	Revetments; length, 335 m and 171 m (1100 and 560 ft)
171	917805	Revetment; length, 372 m (1220 ft)
172	919805	Revetment; length, 427 m (1400 ft)
173	920806	Building; 31 m x 6 m (100 x 20 ft)
174	920807	Revetment; length, 220 m (720 ft)
175	923808	Revetments; length, 488 m and 299 m (1600 and 980 ft)
176	927807 932806	25 Buildings; (924806) 27 m x 11 m (90 x 35 ft), (926806) 43 m x 6 m (140 x 20 ft), (927808) 140 m x 6 m (460 x 20 ft), (929808) 40 m x 8 m (130 x 25 ft), (932807) 43 m x 12 m (140 x 40 ft), (932807) 27 m x 12 m (90 x 40 ft), (933806) 18 m x 12 m (60 m x 40 ft), and (933806) 18 m x 12 m (60 x 40 ft)
177	935802	Revetment; length, 128 m (420 ft)
177A	939804	2 Buildings
178	974819	5 Buildings
179	976818	Grandstand
180	976818	Observation Tower; height, 7 m (22 ft)
181	907780	2 Buildings; 12 m x 8 m (40 x 25 ft) and 18 m x 11 m (60 x 35 ft)
182	913778	Revetments; Bicford Rocket Range, 16 parallel, length, 18 m (60 ft)
183	008817	Grandstand
184	008816	Observation Tower
185	(3) 008817 (4) 013811	7 Buildings; (012812) 16 m x 10 m (52 x 32 ft) and (012812) 33 m x 10 m (107 x 32 ft)
186	015806	Sewage Disposal Plant
187	(1) 017803 (4) 014797	5 Buildings
188	014797	Grandstand
189	022792	Cemetery
190	037800	Tower (type unknown); height, 15 m (50 ft)
191	051800	Clay Pit
192	139812	3 Buildings; 17 m x 7 m (56 x 22 ft) 6 m x 12 m (20 x 38 ft) and 6 m x 12 m (20 x 38 ft)
193	150819	2 Buildings
194	156802	Cemetery
195	177810	Building
196	007777 011773	2 Grandstands
197	012774	Observation Tower; height, 6 m (18 ft)
198	(1) 010778 (4) 011774	5 Buildings; all buildings are 8 m x 8 m (25 x 25 ft)
199	(1) 014779 (4) 015783	5 Buildings
200	015784	Grandstand
201	165792	Building
202	173793	4 Buildings
203	188791	Sand Pit
204	870785	Building
205	885761 886767 886770 886772	4 Buildings
206	895758	Sand Pit
207	900767	Building
208	914753	3 Buildings
209	926766	Sand Pit
210	027759	7 Buildings
211	027759	Grandstand
212	030769	Grandstand
213	030769	3 Buildings
214	032772	Building
215	032772	Observation Tower
216	035775	2 Buildings
217	034772	6 Buildings
218	054778	3 Buildings; 18 m x 9 m (60 x 30 ft)
219	076765	Building
220	930722	4 Buildings
221	933723	Sand Pit
222	951721	2 Buildings
223	976743	Revetment; length, 254 m (833 ft)
224	976735	Building
225	986729	Observation Tower; height, 11 m (37 ft)
226	986731	7 Buildings
227	986729	2 Buildings
228	015731	3 Buildings
229	015731	Grandstand
230	025740	2 Buildings
231	025740	Bleachers
232	025740	Observation Tower
233	032729	Sand Pit
234	036742	Tower (type unknown); height, 24 m (80 ft)
235	046747	Grandstand
236	048745	18 Concrete Pill Boxes; 8 m x 6 m (25 x 18 ft)
237	074729	Building
238	074730	Grandstand
239	949713	Building
240	034722	Sand Pit
241	037718	Goodhope Cemetery
242		44 KV Electric Powerlines; shown only outside of cantonment areas

* For additional information on borrow pits, see section on Engineering Geology.
** Dimensions of buildings only given for the larger, significant structures.

FORT BENNING, GEORGIA

TERRAIN ANALYSIS

NON-URBAN CULTURE FEATURES

- Grandstand or Bleachers
- Building
- Revetment
- Cemetery
- Observation Tower
- Pit
- Abandoned Airfield
- Ruin
- Sewage Disposal Plant
- Tower, Use Unknown
- Concrete Pillbox
- Electric Power Substation
- Power Line
- Camping Area

1:50,000 SHEET INDEX

3949 II	ELLERSLIE 4049 III	TALBOTTON 4049 II
SEALE 3948 I	COLUMBUS 4048 IV	BUENA VISTA 4048 I
3948 II	LUMPKIN 4048 III	4048 II

Scale 1:50,000

1 ½ 0 1 2 3 Statute Miles

1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

1 ½ 0 1 2 3 Nautical Miles

CONTOUR INTERVAL 20 FEET

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

III. OFF-POST FEATURES

A. AIRFIELDS

There are 16 urban areas with populations greater than 2,500 within a radius of 50 miles of the reservation. These urban areas are in Georgia and Alabama and range in size from 2,682 to 155,028 persons. Although the latest data characteristics of each town were asked for by visits, letter, or telephone, not all data were acquired in time for publication.

There is only one airfield within a 50-mile radius of the base that will support C-130A's or larger.

There are no military or commercial ports that will support oceangoing vessels within a 100-mile radius of the reservation.

MAP NUMBER AND/OR NAME; LOCATION; TYPE; AND CLASSIFICATION	ELEVATION AND STATUS	RUNWAY DESCRIPTION	TAXIWAY, PARKING, APRON, AND HARDSTAND AREA DESCRIPTION	BUILDING DESCRIPTION	POL FACILITIES	NAVIGATIONAL AIDS	REMARKS
Columbus Metropolitan; grid reference 933995; airfield; civil	121 m (397 ft) Operational	Longest runway: 2134 m long, 45.7 m wide (7000 ft long, 150 ft wide); azimuth, 50°-230°; maximum weight bearing capacity S40, T100, ST127; asphalt surface in good condition. Runway 2: 1219 m long, 45.7 m wide (4000 ft long, 150 ft wide); maximum weight bearing capacity same as longest runway. Asphalt surface in good condition.	Taxiway lengths and widths unknown; maximum weight bearing capacity same as runways; asphalt surface. Parking, apron, and hardstand total areas approximately 122,057 m² (1,313,861 ft²); asphalt surface.	One terminal building, 25 x 63 m (83 x 208 ft); concrete construction. One hangar, 33 x 41 m (108 x 133 ft); steel frame construction. Nine steel frame support buildings: 11 x 61 m (35 x 200 ft); 11 x 61 m (35 x 200 ft); 15 x 76 m (50 x 250 ft); 15 x 76 m (50 x 250 ft); 11 x 61 m (35 x 200 ft); 10 x 58 m (33 x 191 ft); 11 x 40 m (35 x 130 ft); 10 x 56 m (33 x 183 ft); 13 x 18 m (43 x 58 ft).	Grades of fuel: 100/130, Jet Fuel ASTM type A-1, with FS11 icing inhibitor.	Control tower 136.6 m (448 ft) above sea level and 17 m (56 ft) high. Flight Service Station Atlanta ATL-NOTAM-ATL; scheduled weather broadcast combination VOR and TACAN; (VOR) VHF omnidirectional range and TACAN (Tactical Air Navigation) UHF pulse-type omnirange and Distance Measuring Equipment (DME); instrument landing system; and airfield surveillance radar. Lighting-rotating beacon, runway lights, approach lights, and high-intensity runway lights.	Commercial aviation fuels are the only fuels used. Major airframe and major powerplant repairs. Aerodrome is only partially covered by the USAF NOTAM System but does not maintain a Military NOTAM file (for complete aerodrome information, Civil NOTAM's must also be consulted).

Note: Runway weight bearing capacity (gross weight of aircraft) is determined by adding 000 to figure following S, T, ST, TT, TDT. Runway weight bearing capacity given is for unlimited operations. Aircraft weight higher than given requires prior permission from aerodrome controlling authority.

S - Runway weight bearing capacity for aircraft with single-wheel type landing gear (C-47, F100).
T - Runway weight bearing capacity for aircraft with twin-wheel type landing gear (C-9A).
ST - Runway weight bearing capacity for aircraft with single-tandem landing gear (C-130).
TT - Runway weight bearing capacity for aircraft with twin-tandem type (includes quadricycle) landing gear (B-52, C-135).
TDT - Runway weight bearing capacity for aircraft with twin-delta tandem landing gear (C-5).

For further information, see DOD Flight Information Publication (enroute IFR-Supplement United States).

B. URBAN AREAS

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	RECREATION FACILITIES	UTILITIES AND MEDICAL FACILITIES
Americus, GA 84°14'W.; 32°05'N.	16,091 (1974)	Total number of occupied units: 5,262. Total number of rental units: 2,368. Total vacant available, all units: 225; vacancy rate of all units, 4.1%. Total vacant available, rental units: 181; vacancy rate of rental units, 7.1%. (1976 data)	5 Elementary schools (grades 1-3); enrollment, 948; (grade 4); enrollment, 318, with program for exceptional children; (grade 5); enrollment, 356, with program for exceptional children; (grade 6); enrollment, 299; (grade 7); enrollment, 269. 1 Junior high school (grades 7-8); enrollment, 578. 1 High school (grades 9-12); enrollment, 719. (1975 data)	6 Parks 22 Tennis courts 1 Private 18-hole golf course 12 Athletic fields (1976 data)	Water: Plant with capacity of 5 mgd; present consumption, 1.9 mgd; no expansion plans. Sewerage: Two plants, one a trickling filter system and the other an extended aeration system; capacity, 2.9 mgd; present load, 1.7 mgd; no expansion plans. Gas: Americus Utility Commission. Electricity: No data. Medical Facilities: Americus—Sumter County Hospital (130 beds); 4 intensive care and 4 coronary units. (1976 data)
Auburn, AL 85°28'W.; 32°37'N.	22,767 (1974)	Number of houses: 5,218. Number of rental houses: 891; average monthly rent, $200; average percent vacant, 6.5%. Number of new houses per year: 130. Average number of sales per year: 300; average sale price, $36,000. Number of apartments: 3,182; average rent, $165-$210; average percent vacant, 5%. (1975 data)	5 Elementary schools (grades 1-6); enrollment, 1,598. 1 Junior high school (grades 7-8); enrollment, 527. 1 High school (grades 9-12); enrollment, 1,045. 2 Private and parochial schools (grades 1-6); enrollment, 27; (grades 1-12); enrollment 339. Auburn University. (1975 data)	1 Auto racetrack 1 Bowling alley 10 Parks 1 Skating rink 4 Ball fields 2 Swimming pools 20 Tennis courts 2 Amateur theaters 2 Football stadiums (1975 data)	Water: City of Auburn, Water Board; 1 treatment plant with capacity of 4200 gpm and 1 well with capacity of 50 gpm; maximum daily capacity of 3 mgd; peak load, 6 mgd. Sewerage: 2 plants, primary and secondary treatment with total capacity of 4.5 mgd; sanitary sewage coverage, 88%. Solid waste disposal by sanitary landfill. Gas: Alabama Gas Company. Other fuels: 3 fuel oil distributors; 1 coal distributor; 2 LP gas distributors. Electricity: Alabama Power Company. Medical Facilities: 1 hospital (216 beds); 1 clinic; 36 doctors and 13 dentists. (1975 data)
Columbus, GA 84°57'W.; 32°27'N.	155,028 (1974)	Number of houses: 31,200. Number of rental houses: 7,500; average monthly rent, $150-$200; average percent vacant, 2-4%. Number new houses per year: 486. Average number sales per year: 450; average sale price, $35,000+. Number of apartments: 29,700; average rent, $100-$225; average percent vacant, 5-10%. (1975 data)	45 Elementary schools (grades 1-6); enrollment, 19,461. 9 Junior high schools (grades 7-8); enrollment, 3,285; 6 schools with programs for exceptional children. 7 High schools (grades 9-12); enrollment, 12,407. Columbus Community College. (1974-75 data)	No data	Water: Treatment plant with full capacity of 54 mgd; present load 27.9 mgd (May); average use 23.8 mgd. No expansion plans. Sewerage: Secondary treatment plant; full capacity, 32.3 mgd; maximum load 34 mgd; average, 25 mgd. Gas: No data. Electricity: No data. Medical Facilities: Doctors Hospital (252 beds); St. Francis Hospital (304 beds), 10 intensive care and 4 coronary units; Medical Center (492 beds), 29 intensive care and 8 coronary units. (1976 data)
Cuthbert, GA 84°48'W.; 31°46'N.	3,972 (1974)	Number of houses: 1,200 Number of rental houses: 250; average monthly rent, $40; average percent vacant, 0%. Number new houses per year: 4; average sale price, $18,000-$20,000. 5 Apartment houses, always full; average monthly rent, $60-$65. (1976 data)	1 Elementary school (grades 1-6); enrollment, 952. 1 High school (grades 7-12); enrollment, 1,011. (1974-75 data)	1 Park 6 Tennis courts 3 Athletic fields 1 Golf course, private (1976 data)	Water: Treatment plant full capacity, 1.4 mgd; present load, 0.6 mgd. Chlorine gas and sodium chlorite treatment. Sewerage: No treatment at this time, but 18.6-acre oxidation pond. Full capacity, 1 mgd; present load 0.5 mgd. Gas: No data. Electricity: No data. Medical Facilities: Public health clinic (40 beds); 2 coronary care units. (1976 data)
Dawson, GA 84°26'W.; 31°46'N.	5,383 (1974)	Number of houses: 1,765. Number of rental houses: 819; median monthly rent, $35; number for rent, 42. Number of houses for sale: 24; median price, $13,400. Vacant year-round: 96. (1970 data)	1 Elementary School; enrollment, 819. 1 Primary school; enrollment, 676. 1 Junior high school; enrollment, 480. 1 High school (grades 9-12); enrollment, 687. (1976 data)	Public 1 Outdoor park 3 Playgrounds 1 Swimming pool 2 Football fields 2 Baseball fields 2 Playgrounds Private 2 Tennis courts 2 Football fields 2 Baseball fields 2 Playgrounds (1976 data)	Water: No data. Sewerage: No data. Gas: No data. Electricity: No data. Medical Facilities: Terrell County Hospital (34 beds). (1976 data)

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	RECREATION FACILITIES	UTILITIES AND MEDICAL FACILITIES
Eufaula, AL 85°10′W.; 31°54′N.	9,102 (1974)	Number of houses: 3,034. Number of rental houses: 1,102; number of houses for rent, 93; median monthly rent, $51. Number of houses for sale: 27; median price asked, $15,400. Vacant year-round: 188. (1970 data)	2 Elementary schools (grades 1-5); enrollment, 1,120. 1 Junior high school (grades 6-8); enrollment, 737. 1 High school (grades 9-12); enrollment, 753. 1 Vocational school (grades 9-12). (1970 data)	1 Public 18-hole golf course 1 Private 9-hole golf course 4 Public parks (1200 acres); 22 public parks on shore of Lake Eufaula 2 Public swimming pools 2 Private swimming pools 15 Public tennis courts 6 Private tennis courts (1970 data)	Water: Water Works and Sewer Board; 5 wells with capacity of 500 gpm. Plant can treat and pump 3.6 mgd; average consumption, 1.0 mgd. Sewerage: 2 Lagoon (oxidation) plants; capacity, 1.38 mgd; present load, 0.91 mgd. Gas: Southeast Alabama Gas District. Electricity: Alabama Power Company. Medical Facilities: 1 hospital with a 4-bed special coronary care unit. (1970 data)
Fairfax, AL 85°11′W.; 32°48′N.	2,722 (1974)	Number of houses: 1,014. Number of rental houses: 738; median monthly rent, $33; number of rentals, 24. Number of houses for sale: 8; median price asked, $7,100. Vacant year-round: 47. (1970 data)	4 Elementary schools (grades 1-6); enrollment, 1,378. 1 Junior high school (grades 7-9); enrollment, 868. 1 High school (grades 10-12); enrollment, 508. 1 Parochial school (grades 1-12); enrollment, 299. (1974 data)	1 Bowling alley 1 Country club 10 Ball fields 2 Swimming pools 2 Tennis courts 1 Golf course Private river and county lake for fishing (1974)	Water: East Alabama Water District; source, Chattahoochee River; plant capacity, 4 mgd; average load, 1.1 mgd. Sewerage: Aerated lagoon treatment plant; capacity 3 a day hold. Sanitary sewer, 50% coverage. Solid waste disposal by landfills. Gas: Alabama Gas Corporation. Other fuels: fuel oil, LP gas, and coal available. Electricity: Alabama Power Company. Medical Facilities: 1 hospital (121 beds); 1 clinic, 15 doctors, and 3 dentists. (1974 data)
Lafayette, AL 85°24′W.; 32°54′N.	3,530 (1974)	Number of houses: 1,168. Number of rental houses: 473; median monthly rent, $30; number for rent, 55. Number of houses for sale: 7; median price asked, $13,800. Vacant year-round: 85. (1970 data)	1 Elementary school (grades 1-3); enrollment, 283. 1 Middle school (grades 4-7); enrollment, 474. 1 High school (grades 8-12); enrollment, 559. 1 Parochial school (grades 1-12); enrollment, 335. (1976 data)	1 Park 5 Ball fields 1 Tennis court West Point Lake (1976 data)	Water: City of Lafayette; source, 100-acre lake. Maximum plant capacity, 1.516 mgd. Sewerage: Trickling filter treatment plant; capacity, 1 mgd; present load, 40%. Gas: Southern Natural Gas Co.; distributed by the city. Other fuels; fuel oil, Standard Union Co. and 3 LP gas distributors. Electricity: Alabama Power Company. Medical Facilities: 1 hospital (38 beds); 1 clinic (no beds); 1 doctor. (1976 data)
La Grange, GA 85°02′W; 33°03′N.	23,301 (1974)	Number of dwelling units: 7,966. Number of rental dwelling units: 3,600+; average monthly rent, $150-$250; average percent vacant, 2%. Number of new houses per year: 75-100. Average number of house sales per year: 400±; average sale price, $35,000-45,000. Number of apartments: 765; average monthly rent, $150-$200. (1975 data)	8 Elementary schools (grades 1-7); enrollment, 2,903 includes program for exceptional children. 4 High schools (grades 8-12); enrollment, 2,455; includes program for exceptional children. (1974-75 data)	Public 10 Parks 9 Tennis courts 4 Softball fields 2 Baseball/football field combinations 6 Little League Baseball fields 3 Football fields 1 Track & field area 1 9-hole golf course 1 Softball/football field combination Private 10 Tennis courts 1 18-hole golf course 2 Softball fields 2 Multiple use areas 1 Football field 1 Baseball/football field combination (1976 data)	Water: Full plant capacity 8 mgd; present load, 6 mgd. Sewerage: 4 secondary treatment plants; full capacity, 6 mgd; present load, 5 mgd. Gas: Southern Natural Gas Company. Electricity: No data. Medical Facilities: West Georgia Medical Center (270 beds); 5 beds intensive care; 14 beds coronary care. (1976 data)
Lanett, AL 85°24′W.; 32°54′N.	6,908 (1974)	Number of houses: 2,438. Number of rental houses: 797; median rent, $44; number for rent, 45. Number of houses for sale: 25; median price asked, $9,200. Vacant year-round: 102. (1970 data)	2 Elementary schools (grades 1-6); enrollment, 800. 1 Junior high school (grades 7-8); enrollment, 275. 1 High school (grades 9-12); enrollment, 500. 1 Parochial school (grades 1-12); enrollment, 303. (1974 data)	1 Country club 3 Ball fields 2 Swimming pools 1 Tennis court 1 Golf course (1974 data)	Water: City of Lanett. Plant capacity, 4 mgd; average daily consumption, 0.7 mgd; peak consumption, 0.7 mgd. Gas: Southern Natural Gas Corporation. Sewerage: Treatment plant and sanitary sewer system (no capacity data). Electricity: Alabama Power Company. Medical Facilities: 1 hospital (121 beds), 1 doctor and 1 dentist. (1974 data)
Little Shawmut, GA 85°09′W.; 32°50′N.	2,682 (1970)	Number of housing units: 752. Renter occupied: 232. Vacant year-round: 29. Average number of sales per year: 3. Number for rent: 14; median rent, $30. (1970 data)	No data.	No data.	No data
Manchester, GA 84°38′W.; 32°51′N.	4,779 (1974)	Number of houses: 1,562. Number of rental houses: 442; median rent, $30; number for rent, 26. Number of houses for sale: 7; median price, $5,000. Vacant year-round: 66. (1970 data)	No data.	Public 4 Parks 2 Tennis courts 2 Baseball/football fields 1 Football field 1 Softball field Private 22 acres of parks 3 Tennis courts 1 18-hole golf course 2 Baseball/softball fields 1 Football field (1976 data)	No data.
Opelika, AL 85°23′W.; 32°39′N.	19,027 (1974)	Number of houses: 6,830. Number of rental houses: 860; average monthly rent, $110; average percent vacant, 1%. Number of new houses per year: 148; average number sales per year, 370; average sale price, $37,500. Number of apartments: 1,146; average rent, $145; average percent vacant, 2.5%. (1975 data)	2 Elementary schools (grades 1-3); enrollment, 1,087. 3 Elementary schools (grades 4-6); enrollment, 1,124. 1 Junior high school (grades 7-8); enrollment, 793. 1 High school (grades 9-12); enrollment, 1,377. 1 Parochial school (grades K-12); enrollment, 362. Opelika State Technical College. Southern Union Jr. College. (1976 data)	1 Bowling alley 1 Outdoor movie 1 Indoor movie 2 Parks 1 Skating rink 5 Ball fields 8 Swimming pools 12 Tennis courts 1 Golf course (country club) 2 Community centers 300-acre campground (1976 data)	Water: City of Opelika; source, reservoir and springs; maximum daily capacity, 7.5 mgd; peak load, 5 mgd. Gas: Southern Natural Gas, distributed by Alabama Gas Corporation. Sewerage: Lagoon-type treatment plant. Sanitary sewer coverage, 87%. Solid waste disposal by landfill. Electricity: Alabama Power Company, distributed by City of Opelika. Medical Facilities: 1 hospital (218 beds), 38 doctors and 6 dentists. (1976 data)

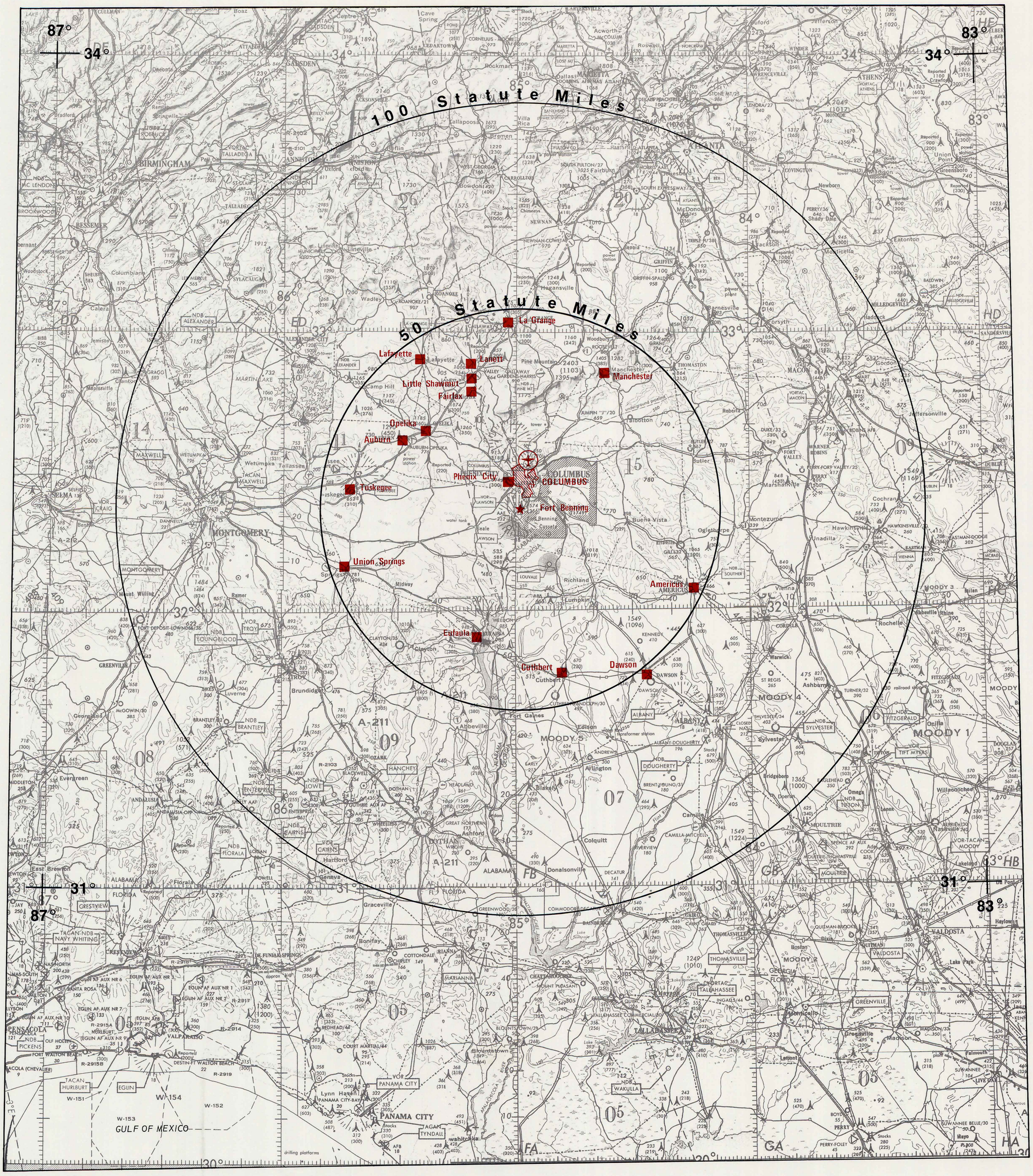
B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	RECREATION FACILITIES	UTILITIES AND MEDICAL FACILITIES
Phenix City, AL 85°01'W.; 32°28'N.	25,281 (1974)	Number of houses: 8,339. Number of rental houses: 3,600; number for rent, 303. Number of houses for sale: 90. Vacant year-round: 542. (1970 data)	8 Elementary schools; enrollment, 2,452. 3 Secondary schools; enrollment, 2,931. 2 Parochial schools; enrollment, 252 and 284. Special education enrollment, 194. 1 Community College; enrollment, 1,400. (1976 data)	3 Parks 1 Outdoor theater 8 Tennis courts 13 Athletic fields 3 Swimming pools 1 Golf course (1974 data)	Water: Phenix Utilities; source, Chattahoochee River. Plant capacity, 5 mgd; average daily consumption, 3.6 mgd; peak consumption, 4 mgd. Gas: Phenix Utilities. Other fuels: fuel oil, coal, and LP gas available locally. Sewerage: Trickling filter treatment plant; capacity 4.5 mgd; present load, 3.6 mgd. Sanitary sewer coverage, 80%. Solid waste disposal by sanitary landfill. Electricity: Alabama Power Company; meters, 14,887. Medical Facilities: 3 hospitals (238 beds); 1 health office; 3 nursing homes, 137 doctors and 45 dentists. (1974 data)
Tuskegee, AL 85°42'W.; 32°26'N.	11,028 (1974)	Number of houses: 3,355.[1] Number of rental houses: 1,441; average monthly rent, $135.[2] Number of new houses per year: 68. Average number of sales per year: 25; average sale price, $30,000. Number of apartments: 640; average monthly rent, $125.[2] (1974 data)	5 Elementary schools (grades 1-6); enrollment, 1,607. 1 Junior high school (grades 7-9); enrollment, 815. 1 High school (grades 10-12); enrollment, 740. 2 Parochial schools. 1 Vocational school. College—Tuskegee Institute. (1974 data)	1 Auto racetrack 1 Indoor movie 1 Skating rink 1 YMCA 6 Ball fields 2 Swimming pools 3 Tennis courts 1 Golf course 2 Parks (1974 data)	Water: City of Tuskegee; source, Uphabee Creek. Treatment plant capacity, 3.5 mgd; average daily consumption, 1 mgd; peak consumption, 2.2 mgd. Gas: Alabama Gas Corporation. Other fuels: fuel oil, coal, and LP gas available in city. Sewerage: Treatment plant, oxidation ponds type. Sanitary sewer coverage, 90%. Solid waste disposal by sanitary landfill. Electricity: Alabama Power Company, distributed by city. Medical Facilities: 2 hospitals (182 beds); 1 clinic, 25 doctors and 2 dentists. (1974 data)
Union Springs, AL 85°44'W.; 32°08'N.	4,324 (1974)	Number of houses: 1,512. Number of rental houses: 597; median monthly rent, $30; number of houses for rent, 61. Number of houses for sale: 6; median price asked, $7,500. Vacant year-round: 109. (1970 data)	2 Elementary schools (grades 1-6); enrollment, 868. 1 Junior high school (grades 7-8); enrollment, 410. 1 High school (grades 9-12); enrollment, 550. 1 Parochial school (grades 1-12); enrollment, 550. (1975 data)	1 Park 5 Ball fields 2 Swimming pools 5 Tennis courts 1 Golf course (1975 data)	Water: City of Union Springs source, wells. Treatment plant maximum capacity, 2.16 mgd; peak consumption, 1.35 mgd. Sewerage: Trickling filter treatment plant; capacity, 1.8 mgd; present load, 50%. Solid waste disposal by sanitary landfill. Gas: Southern Natural Gas. Electricity: Alabama Power Company and Dixie Electric Co-op. Medical Facilities: 1 hospital (30 beds); 1 clinic (32 beds); 5 doctors and 1 dentist. (1975 data)

[1] Figure includes public housing.
[2] Figure does not include public housing.

FORT BENNING, GEORGIA

TERRAIN ANALYSIS



Scale 1:1,000,000

20 0 20 40 60 Statute Miles

20 0 20 40 60 80 Kilometers

OFF-POST FEATURES

- Urban Areas
- Airfield
- Cantonment Area

Prepared by the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. Cartographic and reproduction support by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. September 1976.

IV. LIST OF SOURCES

DOCUMENTS

1. **Maneuverability Study, Fort Benning, Georgia.** June 1976. US Army Engineer Topographic Laboratories, Terrain Analysis Center, Fort Belvoir, VA.
2. **The Master Plan of Fort Benning, Georgia. Phase I, Basic Information Documents. Analysis of Existing Facilities.** Feb. 1976. Robert G. Muir and Associates, Colorado Springs, CO. Under the direction of Corps of Engineers, US Army Engineer District, Savannah, GA.
3. **Engineer Intelligence Study (EIS) 211. Terrain Study of Fort Benning and Vicinity.** June 1958. Prepared under direction of USA Chief of Engineers. Compiled by Military Geology Branch, US Geological Survey, Washington, DC.
4. **The Yield of Sedimentary Aquifers of the Coastal Plain, Southeast River Basins,** by Joseph T. Callahan. 1964. USGS Water-Supply Paper 1669-W.
5. **The Availability and Use of Water in Georgia,** by M. T. Thomson, S. M. Herrick, Eugene Brown, and others. Ga. Dept. of Mines, Mining and Geology Bull. No. 65. Dec. 1956. Prepared cooperatively by the US Geological Survey.
6. **Well Logs of the Coastal Plain of Georgia** by Stephen M. Herrick. Georgia Geological Survey Bull. No. 70. 1961. Prepared cooperatively by the US Geological Survey.
7. **Water Resources Data for Georgia, Water Year 1975.** 1976. US Geological Survey and others.
8. **Chemical Quality of Water of Georgia Streams, 1957-58.** 1961. Rodney N. Cherry. Georgia Geological Survey Bull. No. 69.
9. **Effect of a Severe Drought (1954) on Streamflow in Georgia.** 1963. M. T. Thomson and R. F. Carter. Georgia Geological Survey Bull. No. 73. Prepared cooperatively by the US Geological Survey.
10. Miscellaneous computer printouts and discharge data (untitled and unpublished). 1976. US Geological Survey, Reston, VA.
11. **Special Flood Hazard Information Report, Vicinity of Columbus, Georgia.** 1971. US Army Corps of Engineers District, Mobile, AL.
12. **DOD Flight Information Publication, IFR-Supplement, United States.** 25 March 1976. The Defense Mapping Agency Aerospace Center, St. Louis Air Force Station, MO.
13. **DOD Flight Information Publication, VFR-Supplement, United States.** 29 January 1976. The Defense Mapping Agency Aerospace Center, St. Louis Air Force Station, MO.
14. **Airman's Information Manual, Airport Directory, Part 2.** Spring-Summer 1973. Federal Aviation Administration, Department of Transportation, Washington, DC.
15. **DOD Flight Information Publication, Low Altitude Instrument Approach Procedures, Southeast United States.** 26 February to 22 April 1976. The Defense Mapping Agency Aerospace Center, St. Louis Air Force Station, MO.
16. **Fort Benning Master Development Plan.** January 1975. Robert and Company Associates, Architects-Engineers-Planners, Atlanta, GA. Prepared for the US Infantry Center, Fort Benning, GA.
17. **The Master Plan of Fort Benning, Georgia, Future Development Plans.** 1972. Prepared for the Installation Planning Board, Fort Benning, GA, under the direction of the District Engineer, US Army Engineer District, Savannah, GA.
18. **Master Plan Documents for Fort Benning, Georgia.** 1972. Directorate of Facilities Engineering, Fort Benning, GA.
19. **Housing Characteristics for State, City, and County. Vol. I, Georgia.** 1972. Bureau of the Census, US Department of Commerce, Washington, DC.
20. **Housing Characteristics for State, City, and County, Vol. I, Alabama.** 1972. Bureau of the Census, US Department of Commerce, Washington, DC.
21. **Discover Eufaula, Alabama. Facts and Figures on Living in Eufaula, Barbour County, Alabama.** 1975. Eufaula Chamber of Commerce, City Industrial Development Board, Eufaula, AL.
22. **Alabama Community Data.** Phenix City, 1974; Tuskegee, 1974; Lanett, 1974; Fairfax, 1974; Opelika, 1976; Lafayette, 1976; Union Spring, 1975; Auburn, 1975. Alabama Development Office, Industrial Development Division, Montgomery, AL.
23. Electric Power Data (unpublished). June 1976. Southern Engineering Company of Georgia, Atlanta, GA.
24. La Grange Information Sheet (unpublished). June 1976. Chattahoochee-Flint Area Planning and Development Commission, La Grange, GA.
25. Cuthbert Information Sheet (unpublished). July 1976. City of Cuthbert, Cuthbert, GA.
26. **Short-Term General Hospitals Licensed as of January 1, 1976.** 1976. Georgia Department of Human Resources, Atlanta, GA.
27. **Housing Assistance Plan-Survey of Housing Conditions.** 1976. US Department of Housing and Urban Development. Washington, DC.
28. **Fort Benning, Georgia-Off Base Statistics.** 1976. Department of Community Development, Columbus, GA.
29. City of Americus (unpublished). 1976. Middle Flint Area Planning and Development Commission. Ellaville, GA.
30. City of Dawson (unpublished). 1976. Southwest Georgia Planning and Development Commission. Camilla, GA.
31. **Recreation Facilities Lower Chattahoochee Area, Annual Report, Parks.** 1975. Special Facilities Division.
32. Community Environment Analysis-Hinesville (unpublished). April 1976. Roger Apel and John White. Hinesville, GA.
33. **Soil Survey of Muscogee County, Georgia.** 1926. Phillips, S. W. and Sweet, A. T. US Department of Agriculture, Bureau of Soils, Washington, DC.
34. **Tabulation of Existing and Required Facilities for Long-Range Planning, Fort Benning, Georgia.** 30 December 1975. Robert G. Muir and Associates, Colorado Springs, CO.
35. **Building Information Schedule. Fort Benning, Columbus, Georgia.** 1 June 1973. Hussey, Gay, Bell, and Beach Associates, Savannah, GA.
36. **United States Naval Weather Service World-Wide Airfield Summaries.** United States of America (Southeast Region). Vol. VIII, Part 6. February 1970. Environmental Technical Applications Center, US Air Force, Scott AFB, IL.
37. **Local Climatological Summaries with Comparative Data, Columbus, Georgia.** 1950-1974. US Department of Commerce, Weather Bureau, Washington, DC.
38. **Nautical Twilight at Fort Benning, Georgia.** No date. US Naval Observatory, Nautical Almanac Office, Washington, DC.
39. **AWS Climatic Brief (Fort Benning/Lawson AAF/Columbus, Georgia). Period 1939-1967.** October 1970. Environmental Technical Applications Center, US Air Force, Scott AFB, IL.

MAPS

40. **Fort Benning Reservation Map.** 1:50,000. 1970. US Army Field Printing Plant, Fort Benning, GA. Composite of six US Army Topographic Command topographic sheets.
41. **Fort Benning, Georgia; General Information and Danger Areas.** 1:50,000. 1963. US Army Infantry Center, Fort Benning, GA.
42. **Columbus Hydrography.** 1:50,000. 1974. 378th Engineer Detachment (Terrain), Chicago, IL.
43. **Map of Flood-Prone Areas.** 1:24,000 (selected sheets). 1972-73. US Geological Survey, Doraville, GA.
44. **Map of Flood-Prone Areas.** 1:24,000 (selected sheets). 1971. US Geological Survey, University, AL.
45. **Apalachicola, Chattahoochee and Flint Rivers. Alabama, Florida and Georgia. Navigation Charts.** 1:12,000 (photo maps). March 1976. US Army Engineer District, Mobile, AL.
46. **Experimental Infantry Support Product. Probability of Aerial Detection, Horizontal Visibility, and Fields of Fire.** 1:100,000 (reduced 1:50,000 Buena Vista, Columbus and Ellerslie topographic sheets). 1972. US Army Engineer Topographic Laboratories, Fort Belvoir, VA.
47. **Experimental Infantry Support Product. I.S.P. IIa.** 1:50,000 (back of Buena Vista topographic sheet). 1973. US Army Engineer Topographic Laboratories, Fort Belvoir, VA.
48. **Operational Navigation Chart.** 1:1,000,000. 1975. Sheets G-20, G-21, H-24, and H-25. The Defense Mapping Agency Aerospace Center, St. Louis Air Force Station, MO.
49. **General Soils Map (Soil Associations) of Fort Benning Military Reservation.** 1:50,000. 1976. (unpublished). Prepared by John Johnson, US Department of Agriculture, Soil Conservation Service, Columbus, GA.

AERIAL PHOTOGRAPHY

50. Aerial Photography. 1:20,000 (color film positives). 22 and 23 March 1973. Mark Hurd Mapping Co., Minneapolis, MN. Available US Army Engineer Topographic Laboratories, Fort Belvoir, VA.
51. Aerial Photography. 1:20,000 (color IR film positive). August 1972. Available US Army Engineer Topographic Laboratories, Fort Belvoir, VA.

PERSONAL COMMUNICATIONS

52. Mr. John Metcalf. 23 June 1976. Forester, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
53. Mr. J. Radecki. 12 August 1976. Engineering, Plans and Real Property Office, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
54. Mr. George F. Schladensky. July 1976. Chief, Utilities and Pollution Control Division, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
55. Mr. Hilton Roberts. July 1976. Chief, Mechanical Branch, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
56. Mr. M. R. Carlisle. July 1976. Chief, Sanitation Branch, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
57. MAJ Michael Welch. July 1976. Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
58. Mr. Jerry W. Marshall. July 1976. Chief, Electrical Branch, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
59. Mr. Joe Fuller. July 1976. Plans and Real Property Branch, Directorate of Facilities Engineering, Fort Benning, GA. Telecon.
60. Mr. Calvin T. Roush. July 1976. Dependent School Officer, Directorate of Personnel and Community Activities, Fort Benning, GA. Telecon.
61. CPT James Jeansonne. July 1976. Health Facilities Project Officer, Fort Benning, GA. Telecon.
62. Mr. Willis Smith. July 1976. Chief, Communications Systems Division, USACC Agency, Fort Benning, GA. Telecon.
63. Mr. Henry Zeranski. July 1976. Chief, Plans and Facilities Branch, Directorate of Industrial Operations, Fort Benning, GA. Telecon.
64. Mr. E. Whitehead. July 1976. Housing Division, Directorate of Industrial Operations, Fort Benning, GA. Telecon.
65. G. Tom Fortner. 19 May 1976. Georgia Public Service Commission, Atlanta, GA. Letter.
66. Mr. Robert Garrad. 29 June 1976. Planning Division, Department of Community Development, Columbus, GA. Letter.
67. Mr. Joseph E. Downey. July 1976. Director, Alabama Department of Public Health, Montgomery, AL. Letter.
68. Mr. Max Lockwood. July 1976. Statesboro-Bullock County Chamber of Commerce, Statesboro, GA. Letter.